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Fifth Annual Report

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INSPECTOR OF MINES

—OF THE—

STATE OF MONTANA.

ANNUAL REPORT
FOR THE YEAR

DECEMBER 1, 1893.

CHAS. S. SHOEMAKER - - Inspector

BUTTE, MONT.
INTER MOUNTAIN PUBLISHING CO.
1894.

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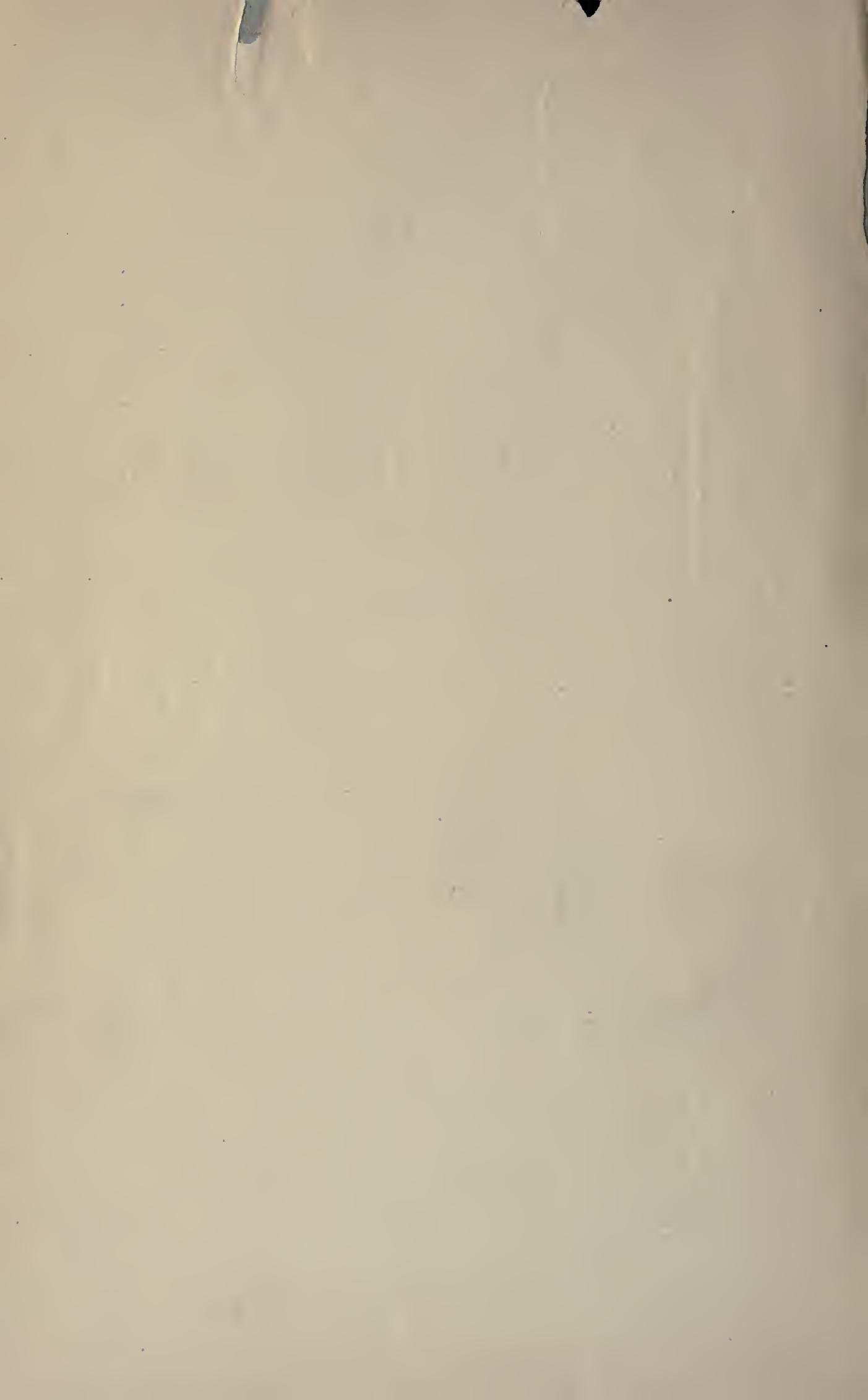
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STATE OF MONTANA.

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HELENA, MONT., December 1, 1893.

To HIS EXCELLENCY, J. E. RICKARDS,

Governor of Montana:

SIR—I have the honor herewith to submit my annual report as Inspector of Mines, embracing their condition and the fatal accidents which have occurred therein from February 7, 1893, to December 1, 1893, with report of my predecessor, Joseph Hogan, from December 1, 1892, to February 7, 1893, the time elapsing between his last report and the date of my assuming office.

On the 20th of November I received from the Deputy Inspector of Mines, notice of his resignation and of his intention to leave for Mexico at once.

He failed to send me a report of the mines he had inspected, or of any accident, fatal or non-fatal, that had occurred in the mines within his jurisdiction, except a brief note regarding the Jay Hawk Lone Pine Co. (which I had previously received from the Superintendent) and a slight account of the death of Frank Snyder at the Granite Mountain Mine.

With such limited time at my disposal I have succeeded in securing the attendant particulars connected with the greater portion of fatal accidents in the mines of this district and prepared them for your inspection.

I have personally investigated the cause of the major portion of accidents mentioned in my report.

I have in some cases gone into detail more explicitly than absolutely necessary but not more, I trust, than the circumstances have justified.

I further beg to call your attention to my report on the Coal Mines of Montana. Trusting the reports will meet with your approval I have the honor to be

Very Respectfully,

Your Obedient Servant,

C. S. SHOEMAKER,

Inspector of Mines.

Introductory.

While I have not been so elaborate in descriptions or gone into topographical and legal detail so extensively as my predecessor, I have given the principal and important facts connected with mines and mining in a brief, concise and, to those who understand the workings of mineral properties, succinct and comprehensive manner.

The "important facts" referred to embrace the engines, rope or cable, mode of hoisting, exits, ventilation and depth. When the word "timbering" occurs it covers every portion of the under-ground workings.

I have deemed it more essential to confine my report to existing realities, with a few necessary and beneficial suggestions, rather than enter into imaginary possibilities. Were the perfect arrangements alone which are found in every mine all utilized in one it would be the model system of the world, without a flaw.

Fifth Annual Report.

CROSSHEADS.

This is a subject which should command the attention and deep consideration of all mine owners and managers.

By investigation, I find that the major portion of accidents from falling crossheads have occurred below the one hundred foot level, though many of them are above that depth.

I therefore think it would be not unreasonable to take some action looking to the complete doing away with, or abolishing, the use of crossheads at a depth not lower than one hundred feet below the surface.

I have also discovered, after observant investigation, that the shorter the crosshead (up and down the shaft) the greater is their liability to stick in the guides, thereby causing a greater number of accidents.

While on this subject, I would call special attention to the report (page 6, paragraphs 3, 4 and 5) made by J. B. Trevarthen, deputy Inspector of Mines for 1890.

Mr. Trevarthen says: "The use of crossheads in place of cages is lessened very materially of late years and in nearly every instance its use has been abandoned so far as practicable.

The law at present prohibits their working below the three hundred foot level in vertical shafts, but this even is too deep where a mine has the assurance of being worked as a permanent concern, as they have neither bonnet or safety appliances of any kind and should a rope break while men are going down or coming up it would bring about an awful catastrophe and men's bodies would be mangled to an unrecognizable condition, or a man may become dizzy and fall off the crosshead with the same results.

Therefore it cannot be done away with any too soon to insure safety while going in or coming out of the mine."

Particular attention should be given to these sensible suggestions as dire results may follow neglect to heed them.

PERMISSION AND REFUSAL TO ALLOW INSPECTION.

Owners and managers of mines should permit the Mine Inspector to examine the ground in every department, inspect the timbering, and generally overlook the internal and external workings immediately connected with the extraction and hoisting of ores.

While the majority recognize and appreciate the benefits to be derived from proper inspection and render all assistance compatible with ownership or management, and endeavor to facilitate matters for the State official, some are obstinate, contrary and unreasonable, thus demonstrating their lamentable ignorance of the dire results which are liable to follow a refusal to permit inspection. Often many disasters would have been avoided had ordinary courtesy been extended the Inspector, and beneficial suggestions listened to, thereby forestalling the primary cause of broken limbs and possibly death.

CANNOT BETRAY CONFIDENCE.

I am pleased to note there are but few persons who, in their lack of mining knowledge and laws regulating well-conducted mineral properties, fail to recognize the indisputable fact that the Inspector of Mines is sworn not to reveal the secrets of under-ground workings and deposits, the magnitude of ore bodies, class of ore and value, or aught else which, if made public, might effect the business interests of owners or leasers.

The Inspector is also accredited with more power than he is.

granted by law. He cannot stop work in a mine, nor can he even enter a mine without permission of those in charge, any more than a private citizen.

PRECAUTIONARY MEASURES.

The majority of Montana's mines are comparatively safe, or as much so as present development will admit.

Precautionary measures for protection to life and limb should be adopted and put in execution as soon as practicable. Work in places where exits are necessary should be pushed as rapidly as consistent.

Safety appliances should be attached to all cages and should be thoroughly tested not less than twice a week.

INSTRUCTIONS.

Employes should have all faulty timbering, all treacherous ground and other defects pointed out to them, and should be instructed regarding every rule and regulation governing the mine.

Employes should be cautioned about putting in shots, preparing blasts, leaving powder and caps too near their work or lying about in a careless and unprotected manner.

Instructions should be verbally repeated by the foreman, from time to time, to impress their importance on every employe.

I cannot consistently overlook the gratifying fact that the greater number of mines in Montana are conducted in a superior manner so far as precaution is taken.

When a new man is employed in the mines referred to, he is usually put to work with an old hand who has instructions to give the new miner all necessary information concerning that portion of the mine where they are engaged, point out the exits and familiarize him with all important matters of both danger and safety.

NEW TRAP DOOR FOR SHAFT.

Particular attention is called to the "Note" item added to my report of the Original mine, located at Butte.

It partially describes a "fire door" introduced in the shaft three or four sets below the surface. The plan, adopted for preventing fire going down the shaft in case the shaft house should be in flames, and destroying the timbering, is excellent.

It is worthy of not only the attention of mine owners but of adoption in all mines.

Very much credit is due the managers of Montana's largest mines, particularly in Silver Bow county, for the means adopted and put in execution to prevent accident and provide ways of escape in case of sudden and unforeseen fire or flood.

EXITS AND VENTILATION.

In a few instances where I have found there were not sufficient ways for the men to escape from the mines in case of fire, caves or other accident, I have advised new openings to be made and I am pleased to note that such advice has been cheerfully acted upon.

During my tour of inspection I was most agreeably disappointed in finding the mines generally, throughout the State, in a much better condition of ventilation than I had anticipated.

I may add that managers are using their every endeavor to furnish plenty of fresh air for men underground, which keeps them in better health and spirits, a condition resulting in the performance of greater labor.

COAL.

I am pleased to state that the managers of the different great coal

mines of the state spare neither time or money to make their mines safe and to furnish plenty of good air.

They seem anxious to provide necessary safeguards for protection and security of employes. Improvements are going on steadily while the output is increasing. The coal business as handled by Montana managers, evidences a surprising degree of thoroughness.

Development is going on rapidly. The law does not require me to state the number of coal mines operated or developed, the amount of work done nor the total quantity produced, yet, I have in a few cases given capacity of mine and daily extraction in tons.

From present indications I predict the coming year will show more gratifying results in coal mining which, in the course of a very short time, will be one of Montana's greatest industries.

MADISON COUNTY.

THE LEITER GOLD MINE is situated eight miles north of Sheridan and is owned and operated by Leiter & Co. T. B. Leiter is general manager; Thomas Lewis, foreman. Thirty-five miners are employed in underground workings and thirty men otherwise engaged. The mine is developed and ores brought to the surface through a tunnel 1,300 feet in length. Steel rail track is laid for cars, stulls are used in timbering, ventilation is good and there are three exits by tunnel up-raises. The character of ore is purely gold.

NOTE—A thirty stamp mill with 50-horse power engine is constantly running on ores from the Leiter mine, which are transported from the mouth of tunnel, a distance of 2,000 feet, down the mountain by bucket tramway.

THE CLIPPER MINE, situated at Pony, is owned and operated by Elling & Morris. W. W. Morris is general manager; James Rooney, foreman. Twelve men are steadily at work underground. Development work is done by tunnels and the greatest length driven into the mountain is 600 feet. Stulls are used for timbering, ventilation is good, the exits are by means of three tunnels and the character of ore is gold.

THE RED BLUFF is situated at Red Bluff and is owned and operated by Ward, Elling & Stewart. Charles Stewart is general manager and foreman. Six miners are working steadily. The mine is developed by tunnel and a two-compartment shaft 110 feet deep. Square sets are used in timbering. Bucket and crosshead is used for hoisting with $\frac{3}{4}$ inch steel rope and a double cylinder link-motion engine. Ventilation is good, the means of exit are two by shaft and tunnel openings. The character of ore is gold.

THE EASTON, owned and operated by Fine & Pankey, is situated about six miles from Virginia City and near the head of Brown's gulch. J. H. Pankey is general manager; Hugh O'Donnell, foreman. Twenty-two miners are employed and the property is developed and worked by tunnel. Timbering is done with square sets and tunnel sets. Ventilation is good, there are four means of exit by tunnel openings and the character of ore is gold and silver.

JEFFERSON COUNTY.

THE C. & D., located at Elkhorn, is owned and operated by the C. & D. Mining Company and is under the direct management of O. R. Allen. Peter Mack is foreman and eighteen miners are employed. The shaft is a single department 330 feet deep and a tunnel has been run in 200 feet. Ore is hoisted at present with a bucket and a $\frac{5}{8}$ inch steel rope by a small Copeland & Bacon engine, from a 40 foot shaft sunk at the face of the tunnel. There are three exits by means of shaft and tunnel. Ventilation is good and the character of ore is hematite iron, carrying a percentage of gold. Timbering consists of tunnel sets, square sets and stulls in the mine.

NOTE—The ores from this mine are all used at the East Helena smelter for fluxing purposes.

THE ELKHORN is located in the town of Elkhorn and is owned and operated by the Elkhorn Mining Company. The general manager is C. A. Molson; foreman, Thomas Davie. The general working force of the mine numbers seventy men, but owing to the low price of silver but fifty miners are now employed. The large single incline shaft has been sunk 1,550 feet on a vein of silver and silver-

lead ore. The mine is timbered with stulls and ore is hoisted by skips with a $1\frac{1}{4}$ inch steel rope handled by a 20x60 double cylinder first motion engine. There are two places of exit by means of shaft opening, and ventilation is excellent. The mine has been in active and paying operation for fourteen years.

THE ALTA is located three miles northwest of Wicks and is owned and operated by the Helena and Livingston Smelting and Reduction Company. This mine has been continuously worked since 1878. O. R. Allen is general manager; L. D. Davis, superintendent; Ole Lewis, foreman. Seventy miners are constantly employed. The top gang consists of seventy men. The principal development has been done by a 1,100 foot drift on the vein with double compartment internal shafts, winzes and stopes. The main tunnel is in 3,100 feet. The character of ore is silver and lead. Timbering is done by stulls, stringers and square sets. An electric hoist, the only one in use in Montana, is used. The cages are handled by a $\frac{7}{8}$ inch steel rope and safety appliances are in place. The means of exit are five in number by tunnel and shaft openings, and ventilation is good.

THE HOPE MINE, located at Basin, is owned and operated by the Hope Mining Company. B. R. Young is general manager; G. F. Kellogg, foreman. Thirty-five miners are employed. The mine has been developed by tunnel and four shafts. The main shaft is double compartment and the depth attained is 200 feet. Stulls and square sets are used in timbering. Hoisting is done with bucket and 1-inch rolled steel rope handled by an 8x14 double cylinder engine. There are two means of exit from shaft and tunnel openings. Ventilation is fair and the character of ore is gold, silver and lead.

THE LIVERPOOL, situated near Clancy, is owned and operated by the M. & M. Mining Company. ——Merrill is general manager. Eighteen men are employed, twelve below and six on top. The shaft is double compartment and 150 feet deep. Timbering is done with stulls and square sets. Hoisting is done with bucket, a $\frac{5}{8}$ inch steel wire rope handled by whim power. There are two exits from shaft openings. Character of ore silver and lead.

THE COMET is located at Comet, six miles northwest of Boulder. It is owned by the Helena and Livingston Reduction Company, but at present is under lease to Frank Murray, who is general manager, with Pat Downing as foreman. Forty miners are working under

ground and thirty-five men on top. The main shaft is double-compartment and 400 feet deep. Square sets are used in timbering. Two cages with $\frac{1}{2} \times 6$ inch steel cable are handled by a Marquette Iron works engine. Safety appliances are in use. There are three places of exit by means of shaft; ventilation is good and the character of ore is silver-lead. The ore is sent to East Helena.

NOTE—Operations were suspended July 1st and seventy men laid off owing to the low price of silver. When the mine closed 2,000 tons of ore was on the dump and a few men were retained to concentrate it.

THE FREIBERG, located at Winston, is owned by Louis Zickler, but is operated by W. B. Thompson who is also superintendent and general manager, with George Gunn as foreman. Twelve miners are employed underground and two on top. Development work has been done through a tunnel now into the mountain a distance of 500 feet. The mine is timbered with tunnel sets and the gold ore is run out by cars. There are two exits by tunnel and upraise and ventilation is good.

FERGUS COUNTY.

THE GILT EDGE is situated five miles southwest from Maiden. The mine is owned and operated by the Gilt Edge Mining Company. W. S. Sherwood is general manager; Albert Winston, foreman. Eight miners are employed below and four men on top. The tunnel is in 200 feet and the workings are timbered with stulls and square sets. Ventilation is good, character of ore gold.

NOTE—The owners of this mine and the Chickadee mine are working both properties. The ledges lay nearly flat and are known by mining men as "blanket veins." The hanging walls are porphyry and the foot walls lime formation.

Coal has been recently discovered farther down the mountain, below the quartz mines. I call attention to this peculiar fact as such singular combinations of different formation in such close proximity, is a rarity. The discovery, however, is gratifying in the sense that

fuel for mining machinery in this section will be abundant, handy and undoubtedly cheap.

THE CHICKADEE MINE is owned and operated by the Gilt Edge Mining Company and officered by the same men as the Gilt Edge. Eleven miners are at work underground and twenty men on top. The property is worked from the 150 foot tunnel and an incline shaft. Timbering is done with stulls and square sets. A car, $\frac{5}{8}$ inch steel rope and whim are used in hoisting. There are three exits by tunnel and shaft; character of ore gold.

THE SPOTTED HORSE is situated at Maiden and is owned and operated by the Spotted Horse Mining Company. J. W. Provard is sole manager; Adam Sagar, foreman. Forty-five miners are at work underground. The main shaft is single compartment and is 380 feet deep. The timbering consists of heavy stulls and square sets. Hoisting is done with bucket and $\frac{7}{8}$ inch steel rope handled by a Kindle engine. There are two means of exit by openings; ventilation is good and the character of ore gold, silver and copper. This is treated in a twenty-stamp mill belonging to the company.

NOTE—I have notified the manager that he was violating the law, "Section 1508, Mining Laws of Montana," in working the mine with crosshead and bucket below the 300 foot level, and suggested that a cage and safety appliance be put in as soon as possible. I have, up to the date of publication of my annual report, received no notification that my suggestion has been acted upon.

MEAGHER COUNTY.

THE M. G. S. & T. MINE is situated six miles east from Neihart. It is principally owned and exclusively operated by Barker brothers. D. L. S. Barker is general manager; Mike Styles, foreman, and only twenty-two men are at present employed. Tunnels have been run as follows: No. 1, 1,016 feet; No. 2, 1,037 feet; No. 3, 1,010 feet, and No. 4, 200 feet. Stulls and square sets are used in timbering; ventilation is good, and there are four means of exit by tunnels. Character of ore, gold and silver.

NOTE—This mine is one of a number known as the Benton Group, mostly located on a tributary of Belt river. The company owning them is the Montana Gold, Silver and Telurium Mining Company. The mine above mentioned prospects very flatteringly for one of the greatest and richest producers in the northwest. On May 1st fifteen men were laid off on account of the low price of silver.

THE DIAMOND R. is situated at Neihart. It is owned and operated by The Diamond R. Mining Company. R. W. Raymond is general manager; W. H. Banks, foreman. Eighty miners are employed under ground and thirty men on top. The main shaft, a two-compartment, is down 500 feet. All timbering in the mine is with stulls and square sets. Hoisting is done with cage, $\frac{1}{2} \times 3\frac{1}{2}$ inch steel cable handled by a first link-motion engine. Safety appliances are in use; ventilation is fair, and there are two means of exit by shaft openings. The character of ore is smelting and milling silver.

NOTE—Owing to the low price of silver, 110 men were laid off and the mine shut down July 28th.

THE MOULTON, situated at Barker, is owned and operated by the Moulton Consolidated Mining Company. Mathew Miller is manager and but eight men are at work. The two-compartment shaft is down 100 feet and well timbered. Hoisting is done with bucket, $\frac{5}{8}$ inch steel rope and steam engine. The character of ore is silver-lead.

NOTE—The development of the mine has but just begun. The property is owned by Milwaukee parties.

THE MOUNTAIN CHIEF (OR "88") is situated on Carpenter creek, about four miles from Neihart, and is owned and operated by Simpson brothers. James McCann is general manager and foreman. Six miners are employed in timbering, and the mountain has been penetrated 1,600 feet. The mine is timbered with tunnel sets; ventilation is fair, and means of exit is by mouth of tunnel. The character of ore is silver.

THE QUEEN OF THE HILLS is located at Neihart. The mine is owned and operated by the Queen of the Hills Mining Company. C. P. Downing is general manager; Charles Braman, foreman. Thirty miners are employed under ground. Development has been done by a 100 foot two-compartment shaft, and a 1,000 foot tunnel,

with a 250 foot double-compartment shaft in the latter. Timbering is done with square sets and stulls. Bucket, with $\frac{3}{4}$ inch steel rope, handled by a 24-horse power engine, is used in hoisting. There are three means of exit by shaft and tunnel openings; ventilation is fair. The character of ore is silver and lead.

NOTE—The major portion of work was suspended and sixteen men laid off July 1st on account of the low price of silver.

THE GAULT MINE, at Neihart, is owned and operated by the Gault Mining Company. It is under the general management of Johnathan McAssy, with Andrew Nelson as foreman, and twenty-eight miners are employed. Development is done through an 800 foot tunnel and a single-compartment shaft 168 feet deep. Hoisting is by means of bucket, 1 inch steel rope, and a 20-horse power Ledge-wood engine. Stulls and tunnel sets are used in timbering. There are two means of exit by tunnel and shaft; ventilation is good to the engine station, but inferior after the station is passed. Character of ore, silver and lead.

THE BROADWATER mine at Neihart is owned and operated by W. J. Clark. Thomas Starbird is general manager; Almond Barnett and John McCovey, foremen. Sixty-five miners are employed. The mine is developed and worked by tunnels and the greatest length attained is 1,100 feet. Timbering is done with tunnel sets and stulls; ventilation is good; there are two means of exit by tunnel openings and the character of ore is silver with some lead.

LEWIS AND CLARKE COUNTY.

THE DRUMLUMMON, located at Marysville, is one of the most extensively operated and best developed mines in Montana. It is owned by the Montana Mining Company, limited. R. T. Baylis is general manager; H. A. Burrell, superintendent; Isaac Warren, foreman; and 120 miners are at present employed. Development work has been done by tunnel nearly 2,500 feet in length and eight shafts, the deepest of which has been sunk 1,400 feet below the tunnel level at a point 400 feet below the surface. This shaft is three-compartment.

ment. The mine is timbered by stulls and square sets. Ventilation is good; there are four means of exit by tunnel openings and three by shaft. Cages with safety appliances are in use throughout the mine. The character of ore is gold. The means for hoisting are as follows:

In No. 1 shaft, which is sunk in the tunnel 1,230 feet from the mouth and 400 feet beneath the surface, a two-cylinder 20x60 Corliss engine and flat steel rope $5\frac{3}{8}$ inch, supplied by Fraser & Chalmers.

Shaft No. 1 on the 800 foot level is used for a retimbering shaft and has a two-cylinder 4x10 Union Iron works engine, $\frac{5}{8}$ inch steel rope six strand, nineteen wires to the strand.

Shaft No. 1 on the 1,400 foot level is worked by one double engine 6x8 and $\frac{5}{8}$ inch steel wire rope, six strands and nineteen wires, supplied by Fraser & Chalmers.

Empire shaft (Cruse level) is supplied with one double engine, 4x10 from the Union Iron works. This shaft is 68 feet below surface and 1,020 feet from No. 1 station on the 400 level.

Shaft No. 2, 735 feet from No. 1 shaft station south, on the 400 level has a double engine 10x12, geared, and $\frac{7}{8}$ inch lock steel, wire rope.

Nine Hour Surface Shaft, 200 feet deep, is supplied with double engine 6x8, Fraser & Chalmers, and $\frac{5}{8}$ inch lock steel wire rope.

Shaft No. 3, on the 400 level, 700 feet below surface and 2,320 feet from No. 1 station on 400, has a single engine 12x20, friction drum (Bullocks) and $\frac{7}{8}$ inch lock steel wire rope.

Nine Hour Raise over the 400 level has a double engine 5x5, Babcock's patent, and $\frac{1}{2}$ inch round steel rope.

THE MACK MINE, near the Whitlatch Union, above Helena, is owned and operated by J. W. McCann, who is also general manager; Thos. Thomas, foreman. The mine is developed by a 1,600 foot tunnel and a good track is laid for cars. Twelve men are steadily at work extracting ores. Timbering is done with stulls and tunnel sets. Ventilation is good and there are three exits by tunnel openings. The character of ore is gold.

SILVER BOW COUNTY.

THE SILVER Bow MINE, located at Butte, is owned and operated by the Butte and Boston Mining Company. C. H. Palmer is general manager; James Hoatson, superintendent; James Henworth, foreman. In shaft No. 1, 212 miners are engaged under ground and twenty-four men on top. A three-compartment shaft has been sunk 900 feet. Square sets are used in timbering. The character of ore is copper and silver. The mode of hoist is by cage, $\frac{1}{2} \times 4$ inch steel cable and 180-horse power Corliss engine. Safety appliances are in use; ventilation is good and there are two exits by shafts and two by raises.

NOTE—One hundred and twenty-five feet west from No. 1 shaft on the 900 foot level, a raise which will connect with a winze from the 800 foot level is going up. It will be completed this month (November) when the means of exit from the mine will be excellent.

Shaft No. 2 is under the same management as No. 1. The shaft is 700 feet deep, from surface to 500 is two-compartment, and from 500 to 700 level is three-compartment. At present but five miners are at work below and five men on top. The mine is timbered with square sets. The character of ore is copper and silver. Ore is hoisted with cage, a 1 inch steel rope and Ledgerwood engine. Safety appliances are in use; ventilation is good and there are two exits by shaft and two by raises.

THE EAST GREY ROCK is owned and operated by the same company and officered the same as the Silver Bow, except D. Polkincorn, who is foreman. Sixty miners are employed under ground and fourteen men on top. The mine is worked from a three-compartment shaft 1,200 feet deep. Timbering is done with square sets, and the character of ore is copper and silver. The mode of hoisting is with cage and $\frac{1}{2} \times 5$ inch steel cable, handled by a McCauley engine from the Chicago Iron Works. Ventilation is good. There are three exits, two by shaft and one by Wild Bill mine. Safety appliances are in use.

NOTE—Crosscuts are being run north and south from the 1,200 to cut the veins. When completed a raise will be made to the 1,000. This will give improved ventilation and furnish extra means of exit for the employes in cases of necessity.

THE WEST GREY ROCK, an extension of the East Grey Rock, is also owned by the B. & B., but is under lease to Thomas Scadden & Co., James Northey & Co. and Richard Williams & Co. The mine is worked through a two-compartment shaft 700 feet deep. A cage and $\frac{5}{8}$ inch steel rope, handled by a steam engine, are used in hoisting the copper and silver ores. Safety appliances are in use and are tested at least once a month, the same as are those in the East Grey Rock. There are three exits by shafts, and ventilation is good.

THE MOULTON MINE, located at Walkerville, is owned and operated by the Moulton Mining Company. Joseph K. Clark is general manager and superintendent. Thirty-six men are employed in extracting ores. The two-compartment main shaft has attained a depth of 850 feet. Square sets and stulls are used in timbering. Hoisting is done with cage and 1 inch steel rope, handled by an 8x12 cylinder, 75-horse power Griffith and Wedge engine. Safety appliances are in use. The character of ore is gold and silver. There are six exits by means of shaft openings. Ventilation is good.

NOTE—The Moulton was closed down September 1st on account of the extremely low price of silver. The mine has been operated continuously for the past twelve years, but cannot be worked when silver is below 85 cents without loss to the owners. The main shaft has been recently retimbered from the 200 foot level up with 10x10 timbers. Since September 1st the Moulton forty-stamp mill has been un on custom ores exclusively, crushing about 1,500 tons per month.

THE EVALINE MINE, located at Walkerville, is owned and operated by Forbis & Irvine. George Chapman is manager and foreman and nine miners are employed in the workings. Development has been done through a two-compartment shaft and the greatest depth attained is 290 feet. Square sets and stulls are used in timbering. The character of ore is gold and silver. Hoisting is done with bucket and crosshead and a $\frac{7}{8}$ inch steel rope, handled by a 6x8 cylinder Friction engine. Means of exit are two in number by shaft, and ventilation is fair.

NOTE—As soon as certain connections, now under way, are completed, ventilation will be vastly improved.

THE GAGNON MINE, located at Butte, is owned and operated by the Colorado S. & M. Co. G. W. Goodale is superintendent and John Hewitt foreman. There are sixty miners engaged at present

under ground, including two shift bosses, but not two pump men, who do not figure as miners, and twelve men on top. The shaft is a four-compartment to the 600 and three-compartment from the 600 to the 1,100 foot level. Timbering in the shaft is with 12x12 timbers and in the drifts and stopes by square sets. The character of ore is copper and silver. The mode of hoisting is with skips, a 1 inch steel lock rope and a pair of double-direct, first-motion 22x36 cylinder engines. Safety appliances are in use. The number of exits are two.

NOTE—On account of the drop in silver ninety men have been laid off. A contract has been let to drive a level from the 1,100 station to connect with the vein. When the latter is reached an upraise will be made to the 1,000 foot level, thereby furnishing good means of escape for the miners in case of fire or other accident, and also improved means of ventilation.

THE BOSTON AND MONTANA COPPER AND SILVER MINING COMPANY. This large company own and operate at present the Mountain View, Pennsylvania, West Colusa and East Colusa mines. Thomas Couch is general manager of the entire B. & M. system. The two first mentioned mines are under the superintendence of R. H. Dowe, and the two latter are superintended by Josiah Gilbert.

THE MOUNTAIN VIEW is located at Butte, as are the other three above mentioned. William Jenkins and William Bailey are foremen. One hundred and fifty miners are working under ground and forty other men are employed on top. The three-compartment shaft is down 1,100 feet and is timbered with square sets. The character of ore produced is copper and silver. The mode of hoisting is with cage and a $\frac{1}{2}$ x5 inch steel cable, handled by an Allis direct-acting steam engine. There are two exits by shaft openings. Ventilation is good and safety appliances are in use. They are tested twice each week.

NOTE—A crosscut will soon be driven south from the 1,100 level to cut the main vein. A winze will also be started from above to connect with a raise. When completed it will form a proper means of exit from the lower workings of the mine.

THE PENNSYLVANIA. James Trueing and Thomas Walters are foremen. One hundred and twenty miners are at present working under ground and thirty other men on top. Development has

been done by a 1,150 foot tunnel and 600 foot three-compartment shaft. Timbering is done with square sets. The character of ore is copper and silver. The mode of hoisting is with cage and $\frac{1}{2} \times 5$ inch steel rope, handled by a first-motion direct-acting engine. Safety appliances are in use. Ventilation is good, and the exits are two by shaft and one by tunnel.

NOTE—At the 600 foot station of the new three-compartment shaft a crosscut is being driven south to connect with the ore vein. Different means of exit for the men will soon be ready for use in the lower depths of the mine. The old two-compartment shaft is 470 feet from the new shaft. There are several ways of escape from the 500 foot level in case of fire, flood or other accident.

WEST COLUSA. In this mine eighty miners are at work under ground and ten men on top. The main shaft is two-compartment and 600 feet deep. Timbering is done with square sets. The character of the ore is copper and silver. Hoisting is done with cage and 1 inch steel rope handled by a Ledgerwood engine. Safety appliances are in use. There are five means of exit, three by air and two by hoisting shafts, and ventilation is good.

NOTE—A raise is being made from the lowest depth of the Leonard shaft and when completed will have connections with the 600 foot levels of the West Colusa mine. This will form perfect connections with the levels of both mines, give extra and superior ventilation and also ready means of exit in case of accidents of any nature.

THE EAST COLUSA. In the under ground workings seventy-four miners are employed and thirty-six find work on top. The depth by main three-compartment shaft is 600 feet. Timbering is done with square sets. The character of ore is copper and silver. Hoisting is done with cage and $\frac{1}{2} \times 5$ inch cable handled by an A. P. Allis 240-horse power engine. Safety appliances are in use; ventilation is good and there are five means of exit, three by air and two by hoisting shafts.

THE ORIGINAL is situated in Butte and is owned and operated by W. A. Clark. A. H. Wethey is general manager; R. G. Brown, superintendent; Thomas Bryant, foreman; twenty-four miners are employed below and six men on top. Development work is done through the double-compartment shaft, 500 feet deep. The mine is

timbered with square sets and stulls. The mode of hoisting is by incline cage and 1 inch steel rope handled by a Griffith & Wedge engine. Safety appliances are in use; the exits are two in number, by shaft and upraise, and ventilation is fair. The character of ore is copper and silver.

NOTE—At about four sets below the surface in the shaft a fire door is so arranged that in case of the shaft house taking fire, a string will be at once burned off (or may be cut very quickly) and let drop an iron weight which is connected by wire with an iron pin. When loosened by the weight the pin is removed and the door, which is disengaged, immediately falls, closes the shaft opening and completely shuts the fire off from all workings below. The men may then escape by other exits.

The ore in the mine is hoisted by an "incline cage," a decided improvement, and the only one in use in the State so far as known.

THE COLUSA PARROT, of Butte, is owned and operated by W. A. Clark & Co. A. H. Wethey is general manager; R. B. Brown, superintendent; H. Hesse, foreman. Twenty-five miners are employed under ground and seven men on top. The depth of shaft is 700 feet and is three-compartment to the 300, and from there to the 700 foot level two-compartment. Mode of hoist is by cage with safety appliances, which are tested every day. The rope is 1 inch steel and the engine a friction from the Iron Bay works manufactory. Timbering is by square sets and stulls; number of exits two, from the 600 level up. Ventilation is fair and the character of ore copper and silver.

NOTE—Good ventilation and another exit will soon be had by an upraise from the 700 level to the air shaft in the 600, which is now under way.

THE BLACK ROCK, situated at Butte, is owned and operated by W. A. Clark et al., and is under the management of A. H. Wethey; R. G. Brown, superintendent; T. S. Kilgallon, foreman. But eight miners are employed below at present and two men on top. The two-compartment shaft is 500 feet deep. Timbering in the mine is with square sets. The mode of hoist is with cage, $\frac{5}{8}$ inch steel rope and a 10x12 Ledgerwood engine. Safety appliances are in use and are tested twice a month. Ventilation is good; the character of ore silver; the number of exits three by shafts.

NOTE—Twelve men were laid off July 1 on account of the low price of silver. The mine is also not being worked below the 100 foot level.

THE GOLDSMITH is owned and operated by the Twin City and Butte Mining Company. Thomas Mitchell is superintendent; J. D. Boehme, foreman. But seven miners are at work below and two on top at present. The main shaft is 400 feet deep and timbered with square sets and stulls. The character of ore is silver and gold. Hoisting is done with cage, a 1 inch steel rope and steam engine. Safety appliances are in use; there are four exits and ventilation is good.

THE ALICE MINE, located at Walkerville, is owned and operated by the Alice Gold and Silver Mining Company of Salt Lake and is under the direct management and superintendence of W. E. Hall. William Shovel is foreman and at present but seventy-five miners and topmen are at work. The depth of the three-compartment, or main shaft, is 1,500 feet. The mine is timbered with square sets. The character of ore produced is gold and silver. Hoisting is done with cages, $\frac{1}{2} \times 4$ inch steel rope and an 18×14 Corlis engine. The safety appliances in use are tested twice each month. There are five exits by shaft, and ventilation is good.

NOTE—The Alice was closed down on the 28th of June owing to the extremely low price of silver and 255 men were thrown out of employment. It was impossible to keep the large plant going without great loss to the owners. An arrangement was, however, made with some of the miners and the company to allow a portion of the mine and mill to start up again, the miners consenting to take out ore on a leasing system regulated by quantity and the quality of ore in sight. One hundred and one miners started in on November 24 and the mill began dropping thirty-stamps. Should the system work advantageously the prospect is fair for an increase of men at the mine, and if necessary more stamps will be set to work. The company is also working the Magna Charta, Valdimere, Rising Star, Blue Wing, Pay Master, Currie, and a few other claims, all under the Alice system of lease.

THE POULIN, located at Butte, is operated by Messrs. Swenk and Bricker. Jacob Swenk has the entire management of the mine and men. There are ten miners at work underground and four men on top. The depth of the double-compartment shaft is 350 feet.

Timbering is done with square sets. The character of ore is copper and silver. The mode of hoist is with cage and $\frac{3}{4}$ inch steel rope handled by 6x10 cylinder Clutch engine. Safety appliances are in use and are tested every week. The mine has two exits by shaft and ventilation is good.

The Poulin is under lease to the parties operating it.

THE ANACONDA is owned and operated by the Anaconda Mining Company of Butte. Marcus Daly is general manager; Pat Kane, superintendent; John O'Neil, foreman. The number of miners at work under ground is 370, with eighty men on top. The depth of the three-compartment shaft is 1,250 feet. The mine is timbered with square sets; the character of ore copper and silver. The mode of hoist is with two cages, $\frac{3}{4}$ x7 inch steel rope—flat—handled by a 20x60 engine made by T. P. Morris & Co. of Philadelphia. Safety appliances are in use and are tested every day. Ventilation is good and the number of exits five by shaft opening and St. Lawrence mine.

NOTE—A raise is being made from the 1,100 foot level to connect with the 1,000, and when completed fresh air will be plentiful and exits for the men from all parts of the mine will be good.

THE HIGH ORE belongs to and is operated and managed by the Anaconda Syndicate. M. J. O'Farrell is superintendent; John O'Neil, foreman. Thirty-two miners are at work under ground and thirty men on top. The mine has been principally developed through the large three-compartment shaft, 1,000 feet deep. Timbering is done with square sets. Character of ore copper and silver. The mode of hoist is with cages $\frac{1}{2}$ x4 inch flat steel rope handled by an 18x38 cylinder first-motion engine, manufactured by Dickson Manufacturing Company of Scranton and Wilkesbarre, Pa. Safety appliances are in use and are tested twice each month. There are five exits and ventilation is excellent.

NOTE—At the present time there are no connections from the 1,000 to the Soo level except by main shaft. Crosscuts are being driven to cut the vein on the 1,000. When completed raises will be immediately put through, giving an opening to the Soo. This will give proper ventilation as well as means of exit from the lowest levels and depths.

THE GREEN MOUNTAIN, also of the Anaconda Syndicate, is

under the superintendence of James Laird and John O'Meara is foreman. The mine at present has but thirty-five miners below doing repair work exclusively, and twenty-five men on top also engaged in repair work. The shaft is down 1,000 feet and is three-compartment. Square sets are used in timbering and the character of ore extracted is copper and silver. Cages are used in hoisting with $\frac{1}{2} \times 5$ inch flat steel rope, handled by an 18x48 cylinder first-motion engine, manufactured by Dickson. Safety appliances are in use; ventilation is good and there are four exits.

NOTE—The Green Mountain is connected with the Wake-Up-Jim mine on the 400, 500, 600, 700 and 800 levels and with the Mountain Con. on the 500, 600, 700 and 800 foot levels. The bottom levels are being driven to connect with the Mountain Con. When completed the means of exit will be excellent and the ventilation vastly improved. At the present time every man engaged about the mine is doing repairs, changing ore chutes and putting in other improvements.

THE MOUNTAIN CON. is owned by the Chambers Syndicate but is operated and managed by the Anaconda Mining Company. Larry Manning is superintendent and James Keegan, foreman. Two hundred miners are at work under ground and forty-five men on top. The three-compartment shaft is down 900 feet. Timbering is done with square sets; the character of ore is copper and silver. Cages are used in hoisting with $\frac{5}{8} \times 6$ inch flat steel rope, handled by a direct acting first-motion 20x60 cylinder 500-horse power engine manufactured by T. P. Morris & Co. Safety appliances are in use and are thoroughly tested every week. The number of exits are nine and ventilation is good.

NOTE—The deepest stopeings are from the 800 up. From the 900 station a crosscut is being driven to cut the main lead. As soon as the vein is cut and levels driven about 60 feet each way, upraises will be put through to the 800 level. This will furnish good air and means of exit from the lower workings.

THE MOSCOW, located at Butte, is owned and operated by the Parrot Mining Company and is under the direct management of J. E. Gaylord. Ben Tibby is superintendent and J. R. Evans, foreman. But twelve miners are at present working under ground and three men on top. The shaft is a single-compartment, 250 feet deep. The mine is timbered with square sets and stulls; the character of the

ore copper and silver. The mode of hoist is with bucket and cross-head, a $\frac{3}{4}$ inch steel rope and a Ledgerwood Friction 6x10 engine. The number of exits are two, by shaft, and ventilation is good.

THE PARROT, located at Butte, is owned and operated by the Parrot Silver and Copper Company, J. E. Gaylord is general manager; Ben Tibby, superintendent; Mathew Hodge, foreman. One hundred and ten miners are at work under ground and twenty-four men on top. The main shaft is down 900 feet. It is three-compartment to the 400 level and five-compartment from there to the bottom. Square sets are used in timbering and the ore extracted is copper sulphide. Hoisting is done with cages, to which safety appliances are attached, and they are tested twice each week in presence of the men. One-half by six inch flat steel ropes, handled by a 20x60 cylinder first-motion Fraser & Chalmers engine is in use. Exit is had by vertical shaft opening by air shaft on vein, and ventilation is excellent.

THE GLENGARRY, located at Butte, is owned by R. M. Cobban & Co. At present it is under lease and operated by the Montana Ore Purchasing Company. F. A. Heinze is general manager and superintendent; James M. Rowe, foreman. Fifty-three miners are employed beneath the surface and ten men on top. The main shaft is down 425 feet. Timbering is done with square sets and stulls. The mode of hoist is with cage, $\frac{3}{4}$ inch steel rope and a 10x12 cylinder engine from the Chicago Iron Works. Safety appliances are in use and tested once a week. There are two exits by shaft and upraise. Ventilation is good; character of ore, copper.

NOTE—At the 400 level a crosscut is being driven to cut the lead. When this is done drifts will be run and from them upraises will be made to the 300 level, thus furnishing good means of exit and plenty of fresh air.

THE RARUS, located near Meaderville, is owned by Emanuel Hirbour et al. It is under lease and operated by the Montana Ore Purchasing Company. F. A. Heinze is general manager and superintendent; David Walker, foreman. Fifty miners are employed under ground and seven topmen above. The two-compartment vertical shaft is down 600 feet. Timbering is done by half sets, square sets and stulls. The character of ore is copper and silver. Cage, with safety appliances which are tested every week, is used in hoisting, with $\frac{3}{4}$ inch steel rope, handled by a 10x12 cylinder Fric-

tion engine made by Fraser & Chalmers. There is but one exit, and that by main shaft. Ventilation is not as good as it should be.

NOTE—An upraise has been made from the 500 level to forty feet above the 400 at a distance of 100 feet from the shaft, the latter being the only means of exit or ventilation. I suggested to the foreman the propriety of putting the raise through to the surface. He readily agreed to do so at once and thus secure means of exit and good air.

• THE LEXINGTON, located at Walkerville, is owned and operated by the Lexington Mining Company. C. C. Reuger is general manager and superintendent; M. O'Connor, foreman. The number of miners employed at present does not exceed forty-eight and top-men five. The main shaft is a three-compartment, 1,450 feet deep. The mine is timbered with stulls and square sets. The character of ore is silver and gold. Two cages, with safety appliances tested daily, with $\frac{1}{2} \times 4$ inch flat steel rope, handled by a 12×14 cylinder Fraser & Chalmers engine, are used in hoisting. There are eight exits by shafts and raises, and ventilation is good.

NOTE—The Lexington is at present under lease to the miners, who are working on the same system as that of the Alice, the company receiving a royalty according to quantity and grade of ore.

BEAVERHEAD COUNTY.

THE JAY HAWK is situated near Ponsonby. It is owned and operated by the Jay Hawk Lone Pine Mining Company, under management of Henry Prideaux, with John Harris as foreman. Forty miners are working under ground and thirty men on top. The incline shaft is 1,300 feet deep and the vertical shaft 135 feet deep. Timbering is done with post and cap in the incline and square sets in the vertical. The character of ore is silver. The mode of hoisting is with cages, and safety appliances are in use. Three-fourths inch steel wire rope is used in both shafts, and hoisting is done with a Ledgerwood engine, double cylinder. There are three exits by shaft and incline. Ventilation is good.

NOTE—The ore from this mine and two of eleven others is re-

duced in a mill owned by the company--an English syndicate. The Lone Pine is the greatest producer.

THE HECLA CON. MINING COMPANY of Glendale own and operate the Cleopatra, Ariadna, Silver Quartz, Mountain Sheep, Oneida, Atlantis, Cleve, Tropper, Franklin and Hecla. Henry Knippenberg is general manager; Samuel A. Barbour, superintendent; Daniel McMasters and John Hull, foremen. Fifty-five miners at \$3.50 per day, thirty topmen at \$3 per day and an engineer at \$4.50 per day are constantly employed at present. The depth of shaft attained in the Cleopatra is 3,566 feet and in the Cleve 1,400 feet. Timbering in the mines is done with square sets. The character of ore is silver and lead, mostly carbonates. A regular drum hoist is used and is run by a Fraser & Chalmers engine. Safety appliances are attached to cages and are tested often. Ventilation is excellent. All the mines have two and some of them three means of exit. The greatest length of tunnel is 2,877 feet.

NOTE—Fully one-half of the usual force has been laid off during the past twelve months owing to the low price of silver and lead. Every shaft of the Hecla company is sunk on an incline.

GRANITE COUNTY.

THE GRANITE MOUNTAIN MINE is located at Granite Mountain, four miles above Philipsburg. It is owned and operated by the Granite Mountain Mining Company. J. H. Henley is general manager; D. A. Marshall, foreman. Two hundred and sixty miners are employed under ground and 150 men on top. Development work has been done through a three-compartment shaft and tunnels. The greatest depth attained is 1,550 feet. Hoisting is done with cage and a $5/8 \times 7$ inch steel cable which are handled by a Camp & Lane engine. Timbering is by stulls and square sets. Safety appliances are in use. There are four means of exit by shaft and tunnel openings and ventilation is good. The character of ore is silver chlorinations. The ores are treated at the company's mill.

NOTE—The mine and mill were shut down September 1st and 450 men laid off. The cause of suspension was the extremely low

price of silver. A few men only are employed as watchmen and to look after the machinery and other necessary matters.

THE PURITAN, located two miles above Philipsburg, is owned and operated by the Puritan Mining Company. John McKechney is general manager; Ed. Chenouth, foreman, and the property is worked with twenty-six men. The main shaft is down 320 feet on an incline. The mine is timbered with stulls, posts and caps. Ore is hoisted with bucket and 1 inch steel rope by a Friction engine from the Autumnwa Iron Works of Iowa. There are two exits by incline shaft. Ventilation is good, and the character of ore is silver.

THE HOPE MINE, located near Philipsburg, is owned and operated by the Hope Mining Company of St. Louis, Mo. N. B. Ringling is general manager; Henry Reafeldt, foreman, and twenty-four miners are employed under ground. The mine is worked $\frac{1}{2}$ -y tunnel and a two-compartment shaft 400 feet deep. Stulls and square sets are used in timbering. Hoisting is done from the 135 foot level with bucket, a $\frac{3}{4}$ inch steel rope and Ledgerwood engine. There are five means of exit from tunnel and shaft openings. Ventilation is good. The ore is silver, free milling, and at present is taken out through tunnel.

THE BI-METALLIC, situated at Granite, is owned and operated by the Bi-Metallic Mining Company. Col. W. T. Hart is general manager; James Willoughby, foreman, and 327 miners and topmen generally are employed. The greatest depth attained by the three-compartment shaft is 1,542 feet. Square sets and half sets are used in timbering. Ore is hoisted by cage, with safety appliances attached, and a $\frac{1}{2} \times 6$ inch steel cable, handled by a Fraser & Chalmers engine. There are two exits by way of shaft openings, and ventilation is good. The character of ore is silver with some gold.

NOTE—Operations on the Bi-Metallic were suspended and 300 men laid off August 31st owing to the low price of silver.

THE COMBINATION is situated at Black Pine and is owned and operated by C. D. McClure et al. —— Sherman is general manager and superintendent. One hundred and thirty men are employed under ground and on top when the mine is being worked. The character of ore is silver. Operations were suspended July 1st. Realizing this fact I did not visit the mine.

DEER LODGE COUNTY.

THE BALD BUTTE is situated on Bald Butte and is owned and operated by the Bald Butte Mining Company. Thomas Simcox is general manager; J. R. Simcox, foreman. Twenty-six miners are employed. The mine is developed by a two-compartment shaft and tunnel. The depth attained is 350 feet. Stulls are used in timbering. Hoisting has been done with cage, $\frac{5}{8}$ inch steel rope and steam engine. The character of ore is gold. There are three means of exit and two openings by shaft from the tunnel. Ventilation is good.

NOTE—The tunnel has penetrated the mountain 1,500 feet where connection was made with the shaft which is now abandoned and cars are used in running out the ore.

THE PENOBCOT is located about six miles above Marysville on the summit of the main range of the Rocky Mountains. It is owned and operated by J. H. Longmaide and brother. Frank Longmaide is general manager; Henry Northey, foreman. Fifteen miners are employed. Development work is done through a double-compartment shaft 500 feet deep. Crosshead and skip and $\frac{7}{8}$ inch steel rope handled by a Ledgerwood engine, are used in hoisting. Timbering is done with stulls; ventilation is good; the exits are three in number by shaft openings and the character of ore gold.

NOTE—No men are allowed to ride on the skip.

Coal.

THE SAND COULEE COMPANY'S MINES are located at Sand Coulee, Cascade county. H. Burrell is general manager and superintendent. Three hundred and fifty miners are continuously at work under ground and eighty men otherwise employed on top. Thirty-five miles of car track is laid in the levels and the services of mules sufficient in number to handle the coal extracted are daily utilized. The openings are by tunnel; the character of coal bituminous and the entire under ground workings are well ventilated by two fans which furnish 130 cubic feet of air per minute for each man and 650 cubic feet for each mule. The capacity of the mine is 1,800 tons per day and the production 1,400 tons. No explosive gas has yet been discovered in the mine.

THE BELT COKE AND COAL COMPANY of Cascade county is owned and operated by P. J. Shields & Co. P. J. Shields is general manager and foreman. Twenty men are employed in mining the coal. Levels have been driven in 850 feet. The openings are by levels and the means of exit two. Ventilation is good, the mine being supplied with 140 cubic feet of air per minute for each man and 800 cubic feet per minute for each mule. The mine is timbered with props; the character of coal bituminous, and no explosive gas has been discovered.

THE TIMBERLINE COAL MINE, located at Timberline, Gallatin county, is owned by the N. P. R. R. Co. Charles W. Hoffman is operating the mine; G. B. Hoffman is general manager; James Anderson, superintendent; and Thomas Atherton, foreman. Sixty-five miners are employed under ground and thirty other men on top. The mine is turning out its full capacity of 200 tons per day of bituminous coal. The openings are by slope and good ventilation is created by fan power. Explosive gas has been detected.

THE LIVINGSTON COKE AND COAL COMPANY's mine is situated at Cokedale, Park county. It is owned and operated by the Helena and Livingston Smelting and Reduction Company, and is under the general management of O. R. Allen, with G. T. Wicks as superintendent. The capacity of the mine is 300 tons per day, but the actual daily product is but 250 tons. Seventy-five miners are constantly at work under ground and eighty men on top to attend the ovens and perform other work. One hundred ovens are in use continuously. The character of the coal is bituminous. The openings are by incline shaft and ventilation is furnished by one fan which supplies 850 cubic feet of fresh air per minute to each man. The air is regulated by doors on each of the three levels so that the entire volume can be transferred to either level. Explosive gas has been found in the mine.

THE ROCKY FORK COAL COMPANY, of Montana, located at Red Lodge, own the mines worked under this title. J. M. Fox is general manager and William O'Connor superintendent. In the No. 4 mine 130 men and ten mules are worked on day shift and thirty men and two mules by night. The fan furnishes 315 cubic feet of air per minute to each man and 409 cubic feet for each animal. In the slope thirty men are employed on each shift and 1,905 cubic feet of air per minute is furnished each man by fan power. In the No. 6 mine fifty-four men and five mules are working by day and four men and one mule at night. One thousand and seventeen cubic feet of air per minute to each man and 7,000 to each mule is furnished also by fan. While the mine has a capacity of 2,000 tons per day only 400 tons are extracted. The character of the coal is bituminous; the openings by drift and slope. No explosive gas has yet been discovered.

LIST OF FATAL ACCIDENTS.

DATE.	NAME.	COUNTY.	NAME OF MINE.]	OCCUPATION.	REMARKS
February 4, 1893	T. Tanno	Rocky Fork Coal Co.	Miner.....		Killed by cave of coal.
February 11, 1893	M. S. Clark	Silver Bow	Miner.....		Fell from ladder at time of blast.
February 26, 1893	J. H. Henderson.	East Moscow.	Miner.....		Killed by cave of rock.
February 27, 1893	John Chellen.	Frohner Mine	Miner.....		Killed by explosion of giant powder.
March 8, 1893	William Olds.	H. & H. Mine.	Miner.....		Killed by falling crosshead, 150 foot.
March 22, 1893	John L. Yonson.	Moose Mine.	Miner.....		Killed by falling crosshead, 150 foot.
March 24, 1893	John Lambertson	Blizzard Mine	Miner.....		Killed by cave of large rock from hanging.
April 4, 1893	John Vines	Grey Rock	Miner.....		Caught between car and wall plate.
April 11, 1893	Hermingile Vadnais.	Hige Ore.....	Miner.....		
April 21, 1893	Richard Andrews.	Silver Bow	Station tender		Fell from 100 to 200 level.
April 21, 1893	Edward Pascoe.	Silver Bow	Miner.....		
April 21, 1893	Evan Pugh.	Silver Bow	Miner.....		
April 21, 1893	Antone Beava.	Silver Bow	Miner.....		
April 21, 1893	James Mattio.	Silver Bow	Miner.....		
April 21, 1893	Frank Girard.	Silver Bow	Miner.....		
April 21, 1893	Samuel Rolette.	Silver Bow	Miner.....		
April 21, 1893	Thomas Gray.	Silver Bow	Miner.....		
April 21, 1893	Richard Trembath	Silver Bow	Miner.....		
April 30, 1893	John G. Williams.	Silver Bow	Miner.....		
May 1, 1893	William Corch.	Silver Bow	Miner.....		
May 3, 1893	Frank Puncheril.	Silver Bow	Miner.....		
May 18, 1893	William McHugh	St. Lawrence.	Miner.....		
May 19, 1893	Martin McHugh.	Mouton Mine.	Station tender		
June 23, 1893	John C. Darby.	Granite Mountain.	Miner.....		
August 12, 1893	Isaac Rosevean.	Silver Bow	Gambetta.....		
August 24, 1893	Paul Toomey.	St. Lawrence.	Miner.....		
September 11, 1893	Quintillo Gerardo.	Blue Wing.	Miner.....		
September 15, 1893	Charles Boesch.	Silent Friend.	Miner.....		
October 11, 1893	Robert Steei.	Katie Mine.	Pumpman.....		

LIST OF NON-FATAL ACCIDENTS.

DATE.	NAME.	COUNTY.	NAME OF MINE.	OCCUPATION.	REMARKS.
February 17, 1893	William Bolitho.....		Boston Mine	Miner.....	Injured by falling wall rock.
April 18, 1893	Mike Onda.....	Jefferson.....	H. & H.....	Miner.....	Fractured ankle.
July 23, 1893	John Richards.....		Silver Bow	Miner.....	Cave, Fracture of both legs below the knees.
March 6, 1893	John Conway.....		Silver Bow	Timberman.....	Right leg broken. Afterward died from congestion of the lungs.

Fatal Accidents

T. TANNO. On February 4 T. Tanno, a miner employed by the Rocky Fork Coal Company of Red Lodge, met with an accident from which he died the day following. Tanno had fired a blast in some top coal and two props were knocked out by the shot. Tanno neglected to replace them before going to work. The coal loosened by the blast fell on him and death was the result.

M. S. CLARK. On the 11th of February M. S. Clark, a miner working in the East Moscow mine, fell from the ladder in the shaft and met with injuries from which he died, ten hours after the accident occurred. John O'Leary and Clark were at work in the bottom of the shaft and had charged a couple of holes. After lighting the fuse the two men ascended the ladder to get out of the way of the flying rock. O'Leary was in the lead with Clark climbing up behind. After they had climbed about forty feet, Clark lost his hold on the ladder and fell back to the bottom of the shaft. It is not known whether Clark was fatally injured by the fall or by flying rock from the two blasts which occurred after his fall.

J. H. HENDERSON. On February 26th J. H. Henderson received injuries from which he died the following day. Henderson was employed at the Frohner mine, situated at Red Mountain. His partner, who was working on the night shift, had blasted a hole and after picking down all the rock which seemed loose, began assorting ore from the waste. He had worked under where the shot was fired for five hours, and when relieved by Henderson, told him (Henderson) that more of the ground should be picked down and to look out for the same. While taking down the remainder of loose ground Henderson was caught by a rock weighing about 300 pounds, which became detached, and striking him on the back and shoulders caused injuries from which he died the day following.

JOHN CHELLEW. On February 27th John Chellew, a miner

employed at the "H. & H." mine, near Winston, Jefferson county, owned and operated by the Custer Mining Syndicate Company, met with instant death by the accidental explosion of giant powder. Chellew had drilled a hole in the face of a drift and then went back about 300 feet into a side drift where the powder was kept, to make up the charge. In handling the powder or placing the cap on the fuse he must have neglected to exercise due precaution, as an explosion resulting in his death, soon followed. As he was the only one at work on that level (No. 2) it is impossible to tell exactly how the explosion was brought about.

WILLIAM OLDS. On March 8th William Olds, a miner employed in the Moose mine at Walkerville, owned and operated by the B. & B. Mining Company of Butte, was instantly killed by falling from the 200 to the 300 foot level. Olds, with other miners, had been on top to receive their pay and was returning to work with the men who were to stop off at the 200 foot station. Probably thinking he was at the 300 foot station, Olds stepped off the crosshead and fell 100 feet to the bottom. He was killed instantly.

JONH L. YONSON. On March 22d John L. Yonson, a miner employed at the Blizzard mine, near Wickes, owned and operated by Jacob Kauf, was instantly killed by a falling crosshead. Yonson and a fellow miner named Thompson were going down the shaft on an empty bucket. Thompson noticed that the crosshead was caught and stuck on the guides and told Yonson of the fact, the latter being on the side near the bell rope. Yonson paid no attention and was again told about the crosshead sticking. He replied, "it will stay where it is till we can reach the bottom of the shaft." When within six feet of the bottom the crosshead came down, and striking Yonson on the head, killed him instantly. The crosshead fell a distance of 150 feet and the unfortunate man was entirely responsible for his own death.

JOHN LAMBERTON. On March 24th John Lamberton, a miner employed in the Grey Rock at Butte, was struck by a large piece of rock which fell from the hanging wall. It appears that Lamberton and a fellow miner named Noah Forest, were at work in the face breaking rock and loading it into a car. Forest went to another part of the mine to get some drills. Shortly after his departure Alfred Tippett, who was at work only a short distance away with William Trevarthan in the same stope, saw the rock fall and heard Lamberton make some exclamation but did not understand what was said.

The two men ran to the assistance of Lamberton and found him lying face downward, his stomach across a plank and the rock, which weighed about 600 pounds, was lying across the small of his back. They removed the rock and took the unfortunate man to the surface. He was at once removed to Murray & Gillespie's hospital but died at 12:30, a few hours after the accident. There were but two bruises and abrasions about the face and neck and the cause of death was attributed by the doctors to internal injuries. The testimony of Foreman David Polkinghorn before the coroner's jury, was to the effect that the mine generally was unusually safe and the place where Lamberton was injured was not at all dangerous. Several other miners who were working there corroborated Polkinghorn's statement. They said if that particular spot was unsafe it was Lamberton's own fault as every miner was supposed and expected to catch up the ground where he is at work and always look after his own safety first. They said that all timbers and necessary appliances were at hand especially to make the ground safe and protect the men at work. In the opinion of all who testified, Lamberton alone was to blame for his own death.

JOHN VINES. On April 4th John Vines met with an accident which resulted in his death soon after it occurred. Vines was station tender at the forty foot level of the High Ore mine, owned and operated by the Anaconda Mining Company. There was a carload of machine drills at the forty foot level which had been sent up from the 700 foot level. Vines got on the loaded car to go to the surface and rang three bells, (the signal to hoist men). The engineer, after waiting about forty seconds, hoisted the cage about eight feet, when he saw and felt the rope vibrate and at once concluded there was something wrong. He immediately stopped the engine and very soon word was brought up that Vines had been caught between the bottom of the cage and wallplate of the shaft, crushing him in such a manner that death ensued in a few moments. Vines having disregarded the printed rules of the company, viz., not to ride on a loaded car, shows conclusively that disobedience of orders was the immediate cause of his death and he alone was responsible.

HERMINGILE VADNAIS. At 12 o'clock m. on April 11th, Hermingile Vadnais, station tender at the 100 foot level in F. A. Heinze's Glengarry mine, Butte, was instantly killed by falling from the 100 to the 200 foot level. William Tembey and J. A. Ashburn went down the shaft about 12 o'clock with a load of timbers. These were

removed at the 100 and the cage rung up by one of the men. While piling them up or carrying them into the level Tembey heard an unusual noise as the cage started up and saw Vadnais fall into the shaft. When the men got off the cage Ashburn saw Vadnais in the level, four sets away, and thinks the deceased must have passed behind him while he was handling the timber. When he looked around he saw him tumbling into the shaft. George Davis, who was working near by, also saw Vadnais fall into the shaft. When the signal to hoist was given the engineer waited ten seconds before starting the engine. When the cage was up about eight feet he saw the rope vibrate and stopped the engine at once. It is thought by his fellow workmen that Vadnais went to the cage to fix it for running a car on, and was not aware the signal for hoisting had been given. He was not told of the fact as Tembey stated that had Vadnais wished to use the cage he should have enquired concerning the ringing up. The foreman went down the shaft after the accident, discovered blood on the timbers a few sets below the 100 and found the body of Vadnais floating in the water at the 200 in a horribly mutilated condition. The mine had been allowed to fill so far as the 200 foot level and two three inch planks were across the shaft at that station. In his descent Vadnais struck the heavy plank and shattered them to pieces. From all the evidence adduced the coroner's jury returned a verdict to the effect that Vadnais came to his death from the causes mentioned and due to his own carelessness.

THE SILVER BOW MINE HORROR.

RICARD ANDREWS, EDWARD PASCOE, EVAN PUGH, ANTONE BEAVA, JAMES MATTIO, FRANK GERARD, SAMUEL ROBETTE, THOMAS GRAY, RICHARD TREMBATH.

The most horrible mining accident during the year occurred on April 21st when nine men were imprisoned by fire in Shaft No. 2 of the Silver Bow mine at Butte, where all of them lost their lives. The names heading this report are those of the unfortunate miners. The mine is owned and operated by the Butte and Boston Mining Company. The mine was being developed by a force of eighteen men, nine on each shift. At 9:30 a. m. John Kramer, pumpman at the

500 foot station, went to the surface to procure oil. In about one hour he returned to the station and found it on fire. When going down to the 500 Kramer saw Evan Pugh near the shaft at the 400 foot level. Kramer soon returned from the burning station and told him if he wanted to save his life to get on the cage. Pugh called back telling Kramer to "wait until he could get his partner." Kramer waited as long as he could stand the heat and until his hands and clothing were badly burned, (Kramer's evidence before the coroner's jury), and then went to the surface. The nine men imprisoned below were on levels as follows: Two on the 400, three on the 500, and four on the 700 foot level. From the latter level there was no possible way of escape except by the shaft. The men on the 500 and 400 might, however, have passed through the connections into shaft No. 1 and from there reached the surface. It is highly probable these five men became bewildered by the density of smoke until escape was no longer possible and met death by suffocation. Every means suggested by human ingenuity was used to save the imprisoned men, and not until every practical idea had been tried without success, was the mine flooded with water.

On the morning of the 22d, the day following the fire, the bodies of Pugh, Andrews, Pascoe, Beava and Mattio, were rescued from the mine.

After the most thorough investigation, assisted by the B. & B. Co. officials, I find it impossible to learn just how the fire originated. The pumpman kept a large torch, (a tin can with handle on one side and a spout containing a heavy round wick on the other) in the station for the purpose of working around the shaft where it was quite wet. He states, under oath, that before going to the surface he set the torch on a block of wood about twelve or fifteen inches from the division of the two compartments of the shaft and that the torch was in its place and still burning when he went down and discovered the station on fire. A candle was also kept burning on a shelf-shaped tin which was nailed up against the timbers. Whether the fire was caused by the pumpman's torch, or the candle on the tin, or whether one of the miners (who were in the habit of waiting in the pump-room for blast explosions and to eat dinner), in lighting a new candle pushed the old snuff out of the candle stick and left it burning on the floor, which was saturated with oil, is only conjecture.

On April 30th, nine days after the appalling disaster in Silver Bow Shaft No. 2, the bodies of Thomas Gray, Richard Trembath, Samuel Rovette and Frank Girard were recovered from the 700 foot

level. The body of Rovette was found first by the searching party at 10 a. m. It was in the ladder way about five sets up from the 700. It was so badly swollen and the features were so distorted they were beyond recognition. The identification of the bodies subsequently found, established Rovette's identity. His hands and arms were clinging to the ladder as if he had died by suffocation while attempting to escape. The body was taken to the surface and the rescuers returned only to find the water yet above the 700 crosscut.

At 6:30 p. m. another party headed by Charles Allen and James Coutts, descended and found the water so low they could enter the crosscut. Allen and others entered and waded so far as they could. Allen then removed the greater portion of his clothing, tied a rope around his body under the arms, took a torch and second rope in one hand and swam in a distance of 200 feet to the drift running at right angles with the crosscut. In the face of the east drift he found the body of Trembath floating on its back. Fastening the rope to it Allen returned, swimming on his back and towing the body. With great fortitude and endurance he returned and in the west drift found the bodies of Girard and Gray floating close together. He took them out separately and they were sent to the surface and shortly afterwards turned over to the coroner.

The features of all the dead were beyond recognition—black, swollen and distorted. Girard had been a member of the Butte Fire Department and wore a fireman's belt. By this, his gold watch and ring, he was identified. He had been at work in the mine but one day when he met his death. Gray and Trembath were identified by their underclothing.

The theory of drowning, advanced by some of the medical profession, was offset by the fact that there is scarcely half an inch incline to the set, the whole distance to the drift. Had the water advanced to where the men were at work, they would surely have noticed it and could have walked to the shaft where it would not have been to exceed twenty-two inches deep. Had they all been drowned at the shaft there was no current which would have floated the bodies back to the identical positions where they had been at work. The fact of their hair having nearly all come out was also attributed by the doctors to drowning. Another singular fact was that all the bodies were stripped to their underclothes except that of Girard, who had kept his pants on. Many claim the men removed their clothing when nearly crazy from suffocation, as people often do this when laboring under great stress of mind or crazed by fear.

I think it but due to Charles Allen to recognize his noble effort in rescuing the bodies of the unfortunate miners. Such example is worthy of note and of highest commendation. I am informed that the brave Allen performed similar heroic acts a year ago when the Anaconda mine met with its terribly disastrous fire in which nine lives were lost, a like number to those who perished in the Silver Bow.

In looking over my notes taken at the coroner's inquest I find that Allen, who is not a muscularly built man, yet one possessing great strength, finding the water too deep to wade, placed one of the last bodies found across his breast and held it there with one arm, while with the other he propelled himself all the way on his back to where the other men were awaiting him. It was a slow, tedious and difficult task to execute in the crosscut. This fact was sworn to by Allen and corroborated by others who saw the feat performed.

FRANK SNYDER. On April 24th a carman named Frank Snyder died from injuries received at the Granite Mountain mine. Snyder was working on the No. 9 level in the Ruby Shaft. While standing in what he considered a safe place a rock fell down the manway. It struck one side of the chute and glancing, hit Snyder on the head. His injuries soon resulted in death.

JOHN G. WILLIAMS. At the Gagnon mine, Butte, on the morning of April 30th at 7:30, John G. Williams, one of the oldest and most practical miners in the camp, met with a most horrible but instantaneous death. In company with Ed P. Farrell he had gone to the 300 level to attend the necessary work in the shaft. John Poad, the shift boss, left the two men thirty feet below the 300 with instructions to "ease certain timbers," which consists in removing old ones, taking out loose dirt and putting in new timbers. Farrell, in giving his testimony, says: "We got off the skip three or four sets below where opposite partners were working. They got on the skip and went up. Williams and I secured tools and looked around to see what was to be done. The shift boss came down and told me to take out some lagging and dirt and relieve some timbers. He went up and we started to cut a plank with a chisel. I raised the plank with a pick while Mr. Williams went over from the ladderway to the center piece of shaft, six or seven feet from where I stood. He was standing on a solid piece of timber. He soon gave a yell and fell backwards into the shaft while I stood looking at him. He was not a drinking man and we had been working at this particular place for

fifteen minutes. We were there to relieve some of the timbers, which is regular miners work. I went to the surface at once but returned with the shift boss. We found Williams lying face downward on the trip at the 1,000 station. Williams must have forgotten himself and stepped backwards when he fell."

Richard Trippet, a timberman who has worked in the Gagnon mine for ten years, went down on another skip. He found Williams' boots while going down and also his cap. Fifty feet below the 300 he found pieces of skull, and portions of brain and blood was noticeable in several places. When the body was discovered it was in a perfectly nude state, the scalp horribly torn, jaw broken, the skull almost entirely gone and scarcely a whole bone in the body and, strange to relate, there were no abrasions or bruises noticeable on the surface of the skin. The skip was always right where the men were working. It was absolutely necessary for Williams to be on the timber from which he fell. He was undoubtedly examining the work to be done and accidentally stepped off the center piece.

WILLIAM COUCH was instantly killed on May 1st in one of the stopes at the Wild Bill mine, Butte. Couch was working in the breast of the first stope on the 300 foot level, thirty feet east of the shaft. The ground which he was taking down was not at all dangerous in a mining sense. It was solid and not in any discoverable way treacherous. John Youlton was working near Couch and at about 3:30 a. m. called out to him. Receiving no answer he went up into the stope and found Couch sitting down with his back to the breast, with his head between his knees, and just beside him a rock weighing 250 or 300 pounds. Couch had evidently been dead for some little time; but the body was still warm. William Opie, a fellow miner who was working about thirty feet away, came to Youlton's rescue and together the body was lowered about six feet, taken to the shaft and sent on top by the crosshead. The mine was thoroughly examined by Deputy Mining Inspector Gilbert who found the timbering up to three or three and one-half feet of the breast, with good ground on sides and top. The ground had been previously tested and was pronounced safe. The fall of the rock was caused by a "slip," or seam lying between the wall and ore. The rock caught Couch when he was probably coming out of the stope and did not fall over one foot before striking him back of the neck while he was stooped a little forward. Had it fallen while he was in a sitting position the body would have been crushed.

FRANK PUNCHERI. At 7:30 on the morning of May 3d Frank Puncheri, a miner at work in the bottom of the shaft at the Trevonia mine, Butte, was almost instantly killed by a cage falling on him. At 7 o'clock Pencheri, J. J. Tompkins, John Kilbride and Thomas Fox went down to sink in the bottom of the hoisting shaft. The first car was rolled out, the cage ready for hoisting, when the pumpman, who was two sets, or eight feet above, called out to the bellman to stop where he (Flannagan) was standing on the timbers. The proper signals were given and Flannagan got aboard and asked for three bells. These were rung but the cage, instead of going up, dropped to the bottom, Flannagan shouting as it started, "My God, look out!" He was thrown off the cage by the shock but immediately jumped up and said, "There is a man under the cage." The car was at once rung to the top, and Puncheri, whose body was mostly in the shallow sump, was taken out. The car soon came down empty, but returned with one of the men, who notified those on top of the accident. Puncheri was still alive but unconscious. He was taken to the surface and removed to the office where he soon died. He was bruised but very little, having but one mark on the back of his head. Investigation discloses the fact that the latch of the break lever was broken some time that morning; that then the engineer who came on day shift was notified of the damage done and told the foreman it should be repaired at once. The foreman said he thought it perfectly safe to hoist without the latch, but would attend to the matter. The work of repair would have required not to exceed an hour and should have been done at once: In attempting to hoist the first car load of dirt the lever, which was held by the engineer's foot while he handled the break apparatus with one hand and the steam throttle with the other, flew back and threw the engineer across the room. Before he could get to his place again the cage had dropped and caught Puncheri underneath.

WILLIAM McHUGH. On the 18th of May, at 10 p. m., William McHugh, a miner employed in the St. Lawrence mine at Butte, was instantly killed by falling from the 900 to the 1,000 foot level. Mike Farrell and Topman William Flavan were going down to the 1,000 and stopped at the 800 level, where McHugh boarded the cage and went to the bottom. The three remained on the 1,000 until they had finished sending up waste. Farrell says he then gave the signal to hoist to the 900—one and four bells. The cage went up slowly to the 900 and stopped five or six seconds. McHugh, who had some drills with him, passed under the guard bar, but just as one foot

touched the level the cage began going up again. McHugh lost his balance and fell or rolled backward into the east shaft. It appears from the sworn evidence that the cage stopped thirty feet higher up just as Ferreil was ringing it to the 800. When the cage arrived there Farrell told his partner that a man had fallen down the shaft. They went to the surface, got Tom O'Neil, the shift boss, and returned to the 1,000 in about two minutes. The cage went down the west shaft. McHugh's dead body was found lying across the bulkhead in the east shaft and was quickly removed to the surface. Flavan corroborated Farrell's evidence even to the ringing of the bells. The engineer, however, testified that he thought he received two and two bells for the 800 and ran very slowly to the 900 so that he could stop quickly in case he got another signal. He said that often the men rang the bells very close together and again did not pull the rope hard enough to ring, but that he acted on the vibration of the rope. The coroner's jury returned a verdict of "Death caused by falling, etc., and that said fall was caused by carelessness and contributory negligence." The reader is left to guess whether the "carelessness" was on the part of the deceased or the engineer, or the man who did or did not ring proper signals. The evidence of the engineer and his breakman was in conflict with the station tender and topman.

MARTIN McHUGH. On May 19th Martin McHugh, a station tender, was instantly killed at the Moulton mine at Neihart. McHugh was sending ore up from the 400 foot station at the time of the accident. It was stated to me by the foreman and several of the miners that McHugh was in the habit of running a car of ore onto the cage and then ringing a hoist bell, after which he would tag the grade of ore. He had been cautioned by the foreman, the pumpman and several of the miners not to do so as he was very liable to get caught. There was no person present at the time of the accident, but from all the information gathered relating to the calamity, it is shown that McHugh had rang the bell to hoist a car of ore, then stepped on the edge of the bottom of the cage to tag the ore and remained there too long, as when the engineer started to hoist he felt something had caught the cage, causing the rope to vibrate. He had hoisted about eight feet but at once slacked back to the bottom of the station and told the topman there was something wrong at the 400. The topman, accompanied by a timberman, went to the 400 station where they found McHugh lying dead. Investigation proved that McHugh had been caught between the cage and wallplate at the top of the

station as the body was considerably bruised across the breast. The car of ore was found on the cage.

JOHN C. DARBY. At twenty minutes to 6 p. m. on June 23d, John C. Darby, a miner employed in the Granite Mountain mine, owned by the Granite Mountain Mining Company, met with an accident from which he died in a short time. The miners go off shift at 6 o'clock and usually blast just before leaving. Two other miners, Thomas Fitzsimmons and Walter Lewarn, were working in a stope near where Darby and Fred Seymour were working in a drift on what is called "the south vein," in No. 6. After Darby and Seymour had loaded their holes, Darby started in to spit the fuse. He spitted one of them and had a little trouble in making the other take fire. Seymour told him to come out as the first charge might go off. Darby replied, "There is plenty of time." Walter Lewarn, at that moment, came down out of the stope and called to Seymour and Darby to come out. They did so and went to the shaft and waited for reports. On hearing only one report, Darby and Seymour started back to spit the fuse which they thought had not taken fire. Darby was about twenty-five feet ahead of Seymour and was about to spit the fuse again when the explosion occurred. It appears that when Darby was trying to spit the fuse the first time, enough fire got to the powder to ignite it and the fuse worked while the men were out.

ISAAC ROSEVEAR. August 12th Isaac Rosevear was fatally injured at the Gambetta mine near Meaderville. Rosevear was working alone in a cut on the 700 level and was seen by A. J. Brant, the foreman, at ten minutes to five. He was putting in a shot and called to William Breslin and his partner who were also filling a hole in the stope, thirty feet above, that he was ready to fire and to come down. Breslin's blast was ready and he spitted the fuse. The men came down, went twenty-five or thirty feet to the drift and were followed by Rosevear. Only one charge exploded. Rosevear said it was his shot and started in to see what it had done. The carman called to him as he passed by but received no answer. A moment or two afterwards a second shot, closer and more distinct, was heard. Then the men knew the last was Rosevear's blast and without waiting for the smoke to clear, went into the cut only to find their suspicions, just expressed, that Rosevear must have been hit, actually confirmed. Rosevear was found near the scene of explosion lying with his face to the breast, the scalp badly torn, an eye shot out and the right por-

tion of the skull smashed in. Blood and brains were oozing from the wounds but he was yet alive. The men carried him to the station, sent for Brant, and soon afterwards accompanied the wounded man to the surface. The wounds were sewn up and head bandaged by Dr. Hammond, after which he was sent to Witherspoon's hospital. He never recovered consciousness but died at 11 o'clock that night. Had Rosevear waited the customary time for the smoke to clear away he would undoubtedly be alive today.

PAUL TOOMEY. On August 24th, at the St. Lawrence mine, a miner named Paul Toomey received injuries from which he died the night following. Jerry and Mark Murphy, Mike Dwan and two other miners were at work with or near Toomey on the ninth floor of the 900 foot level. The men had finished their supper on the floor just below their place of work and had started back up the ladder. Toomey was the fourth man to go up and had with him only a short "snuff." This must have went out about the time he reached the upper floor. He started forward in the dark and walked into an ore chute five feet distant from the ladder way. The noise made in going down the chute was heard by Dwan who went up with another man to learn the cause of the strange sounds. Toomey was missed, search was made and the men's suspicious realized when Toomey was found on the bulkhead, eighty feet below. He was somewhat bruised but hurt more severely inside. He was removed to the Sisters' hospital and during the early morning told how he met with the accident. The immediate cause of his death was hemorrhage of the kidneys.

QUINTILIO GERARDI. On September 11th Quintilio Gerardi met his death by falling from the 300 foot station to the 500 foot station in the Blue Wing mine at Walkerville. This mine is owned by the Alice Gold and Silver Mining Company and was under lease to Gerardi, John Zamma and three other Italians, all engaged in working the property. Gerardi was left in the afternoon of September 11th at the 300 foot station by Zamma. It is supposed Gerardi let down the chairs, attempted to cross the shaft on them and slipped and fell, his boots having been necessarily wet from the dripping water. The chairs consist of two $1\frac{1}{2}$ inch square iron bars, which are hung on a hinge on one side of the shaft and are let down across the shaft by a rope. Gerardi and Zamma descended the shaft together on the day the accident occurred. Zamma was working about seventy-five feet from the shaft and knew nothing of the accident until the day following. When Gerardi was missed by his fellow-

workmen search was instituted and resulted in finding his lifeless body hanging across the shaft timbers at the 500 foot station. After letting down the chairs Gerardi, instead of going around the timbers to the other side as he should have done, must have attempted to cross the shaft on the bars, fell through between them and struck the bars at the 500 foot station, killing him instantly. Not having struck anything until the chairs were reached, 200 feet below, and making no noise in the decent, accounts for Zamma's not knowing anything about the accident until search was made twenty-four hours later. The slime on the shaft timbers not being disturbed in the least shows that Gerardi must have fallen straight down between the chairs. I made this examination most thoroughly in company with W. E. Hall, general manager of the Alice G. & S. Co., as it was rumored that there had been foul play and that Gerardi had met his death in some manner not accidental, and if not so, his partners would have known of the accident before twenty-four hours had elapsed.

CHARLES BOESCH was severely injured at the Silent Friend mine, seven miles southeast of Bernice, Jefferson county, on the 13th of September last. He was alone in the bottom of the shaft, ninety feet from the surface, waiting for powder and fuse to be sent from above. The bucket and pump rod is balanced by a heavy bucket of stones on the end of a sweep, which works on the surface. The rod which connects these weights with the gallows frame slipped out of the slot. There is no shaft house and all the timbers and general workings were wet and slippery from snow and rain. When the rod got loose the bucket started down and the brake could not hold it on account of the running gear being so moist. The bucket struck Boesch on the head and knocked him down. When August Swenson, one of his partners, went below, the injured man only remarked: "I am hurt. I have pains in my head." He was taken to the surface when his partners thought it advisable to send him to the hospital in Butte, as they were not prepared to care for an injured person there in the wilderness. Boesch and his two attendants reached Wither-spoon's hospital that evening, but he only lived till morning. He did not recover consciousness after being brought to the surface.

ROBERT STEEL. On Friday, October 20th, Robert Steel, a pumpman at the Katie mine at Basin, lost his life by falling down the shaft 150 feet. The accident occurred as follows: Philip Ploof and Douglas Watson had just blasted a round of holes in the bottom of the shaft. Steel, with Ploof and Watson, had started down the shaft

on a bucket for the purpose of starting the pump. Another bucket, containing shovels, had been carelessly left standing against one of the guides in such a manner as to allow the handles of the shovels to protrude into the shaft, the crosshead being above the handles. As the men started to descend the shaft on the bucket in use the crosshead stuck on the end of one of the shovel handles until the men had been lowered about fifteen feet. Watson, seeing this, climbed off the bucket onto the shaft timbers when the crosshead dropped and struck Steel on the head, knocking him off the bucket and causing him to fall to his death. No bell line being in the hoisting compartment the men were unable to ring a stop signal. Seeing that the accident could have been avoided had the bell line been in the hoisting compartment, I requested Mr. Glass, one of the owners and managers, to change the line from the pump compartment to the hoisting compartment at once, which he promised to do. The shaft of the mine is sunk in a tunnel about 100 feet from its mouth. An upraise to the surface is about the same distance in, and the upraise is used as a shaft above the tunnel in connection with the shaft from the tunnel down. The engine house is situated at the mouth of the tunnel and a little to one side. The gallows frame is at the top of the upraise on the surface, making it impossible for the engineer to see what is taking place at the connections of the shaft and tunnel or, in reality, at the top of the entire shaft.

NON-FATAL ACCIDENTS.

WILLIAM BOLITHO. On February 17th William Bolitho was injured in the Boston mine, owned and operated by the Alice G. & S. Mining Co. Bolitho was taking down ore in a very low stope above the 200 foot level. While in a stooping position a thin slab of wall rock turned out and Bolitho was caught between the slab and a piece of timber. He was somewhat injured, but not seriously.

DAN McCARTY. On April 4th Dan McCarty, a miner employed in the Green Mountain mine at Butte, one of the Chambers Syndicate, operated by the Anaconda Mining Company, met with an accident of a severe nature. He was working in a drift east from the shaft where the ground in the face was somewhat treacherous. It

would not hold long enough for sufficient work to be done ahead for room to place a new set of timbers. While squaring up for a set a slab from the hanging wall turned out, and striking McCarty on the leg, broke the member above the knee.

JOHN CONWAY. In this man's case it is hard to determine whether he died from injuries received in the mine or from a disease subsequently contracted. Conway was employed as a shaft man in the Iowa mine. On March 6th he was taking some guides from the Soo station to the bottom of the shaft and met with an accident and injury consisting of a double fracture of the right leg. The guides had been placed on the cage by Conway and his working partner, a man named Farrell. After the men got on the cage the bell to lower was rung by one of them who forgot to pull out the chairs. The engineer lowered and naturally supposed the cage was going down. Conway, seeing the chairs still in, told Farrell to pull them out. He did so and the cage dropped until the slack was exhausted. In the sudden descent Conway was thrown against the timbers and his right leg broken. Had the slack rope been rung up before removing the chairs the accident would not have occurred. On the 10th of the same month Conway was taken with congestion of the lungs and died on the 11th. Whether his death was the result of complication, primarily caused by the accident and its attendant shock to the system is not known.

MIKE ONDA. On April 18th Mike Onda, a miner at the H. & H. mine at Winston, Jefferson county, was injured in the No. 1 stope by a piece of rock falling from the bank. The rock struck Onda on the ankle and fractured the bones.

JOHN H. WEIR. June 4th John H. Weir, a station tender at the Elkhorn mine, was injured by a car of ore which accidentally dropped down the main incline shaft. Weir was on the skip going from the 1,350 foot level to the 1,250 when a carman named James Williams was coming out of the last named level pushing a car of ore, which went down the shaft. Williams stated to the foreman and others that while pushing the car his foot caught between the rail and run-plank in such a manner that he could not get it out and the car got away from him. In trying to catch it his candle went out and it was impossible to stop the car before it went off the end of the track and into the shaft. Weir does not know whether the car struck him or

whether it was the ore, as they were tumbling down the shaft together. He informed me his injuries were quite serious.

JOHN RICHARDS. On July 23d John Richards, a miner employed in shaft No. 1 of the Silver Bow mine, Butte, sustained a fracture of both legs below the knees. While leveling a sill preparatory to putting a set of timbers in a stope, nearly half a ton of rock and dirt fell from the hanging wall catching him below the waist with the above-mentioned result.

HELENA, Mont., March 6, 1893.

Charles S. Shoemaker, Esq., State Inspector of Mines:

Enclosed find report on accidents. Will see Mr. Oliver and have him forward report on accidents investigated by him.

Respectfully,

JOSEPH HOGAN.

On the 9th of December, 1892, Thomas West, a miner working in the Bi-Metallic mine at Granite, Deer Lodge county, was instantly killed by a fall of ground. At about 11 a. m. West and Robert Brennan were at work in the west drift of the 1,000 foot level and were drilling a hole in the bottom of the drift, at the face, to make room for the timbers. The drift was timbered as close as possible, they being not more than six feet from the breast. A stull had been put in at the breast and some lagging put from the cap on the last set across on the stull to prevent any loose ground from felling until the set could be put in. The ledge formation was not good and the drift a little wet and when the ground gave way so much of it came that it broke through the lagging and caught West with the above stated result.

On December 29, 1892, Frank Fletcher, a miner employed in the Curlew mine, near Victor, Missoula county, received injuries from which he died on January 23, 1893. He was loading a hole at midnight before going to lunch. It was what is called a "pot-hole" in the tale or clay, and he was using a pick handle to tamp the powder. He had the cap and fuse in the hole and he must have struck the cap or tamped the powder too hard and the explosion took place.

On January 13, 1893, Patrick O'Neill, foreman of the High Ore mine at Butte, Silver Bow county, received injuries from which he afterward died. Men were employed retimbering the shaft and O'Neill was down where they were at work. The engineer lowered the cage too far and it struck him.

In closing my report I improve the opportunity to extend to managers, superintendents and foremen of the different mines my sincere thanks for attention shown and courtesies extended while visiting their properties.

My official duties with operators and miners have been pleasant in the extreme.

The time they have devoted to my assistance is appreciated in its every sense and shall be held by me in grateful remembrance.

Those civilities have aided largely in prosecuting and expediting important investigation and gathering information which adds greatly to the value of this report.

Sixth Annual Report

—OF THE—

INSPECTOR OF MINES

—OF THE—

STATE OF MONTANA.

DECEMBER 1, 1894.

CHAS. S. SHOEMAKER	-	-	Inspector
JOHN MILES	-	-	Deputy

HELENA, MONT., December 1, 1894.

To HIS EXCELLENCY, J. E. RICKARDS,

Governor of Montana:

I herewith submit my Second Annual Report of the existing condition of mines in the State of Montana.

Also a list of the fatal and non-fatal accidents which have occurred since December 1, 1893.

Accompanying my report is that of Deputy Mine Inspector John Miles. I would respectfully call your attention to the many valuable suggestions made by this efficient officer as worthy of deep consideration.

Trusting the reports will meet with your approval, I have the honor to be

Your Obedient Servant,

C. S. SHOEMAKER,

State Mine Inspector.

General Remarks.

The Inspector should be empowered to enforce the laws governing mines now in vogue.

The Inspector at present can only notify the manager of an existing danger in the mine, but has no power whatever to enforce a remedy.

There should also be more laws enacted for the protection of human life.

A law should be enacted compelling owners and leasers to have two or more exits from every mine for purposes of safety as well as ventilation, after a depth of 100 feet has been attained.

Section 1508, State Mining Laws, should be changed so that the words "vertical shafts," in the second line of said section, should read "all shafts." This refers particularly to the use of bonnets.

In conversations held with different mine managers I find they are strongly in favor of a universal State code of signals for use in every mine. Such a law would result in the prevention of many accidents and deaths. A major portion of the fatal mine accidents which have occurred in Montana during the past fifteen years are attributable solely to the misunderstanding of signals, the forgetfulness of engineers or from ignorance of the code of signals in use when a new engineer takes charge.

With a universal code of signals it is plain to be seen that hundreds of accidents would be avoided.

Every engineer and miner would have but one code to learn.

This code would be so firmly impressed upon the mind that forgetfulness would be almost impossible. Like the alphabet, these signals would go on from youth to old age, never to be eradicated from the memory when once learned.

At present there are at least fifty different codes of signals in use and when changing from one mine to another miners, engineers and even foremen and managers must learn a new code. This is liable to result in a confusion of ideas, especially where quick work is required.

Therefore I would earnestly request Your Excellency to appoint, at an early day, a committee to consist of not less than five thoroughly expert, practical mining superintendents or managers to carefully investigate this matter and formulate a Universal State Code of Mine Signals. The committee might be known as the "State Board of Mine Signals."

I have no doubt the Legislature would willingly allow their traveling and hotel expenses for a few days while engaged in this necessary work, simply as a matter of future economy and in the cause of humanity.

This necessary requirement is one which will meet with the hearty approval and endorsement of owners, managers and employes throughout the State.

I deem it advisable and absolutely necessary for the safety of the thousands of men employed in mines that the Deputy Mine Inspector should be employed by the year and the office made a salaried one with duties the same as those of the Mine Inspector; but with the proviso that the Deputy's work shall be subject to the order or direction of the State Mine Inspector. It must be remembered that there are now many more mines to be inspected and hundreds of miles more territory to travel to reach the mines than when the law was created. The duties of the Mine Inspector and Deputy, if properly performed, never cease. Very much of my own work has been done at night after traveling the greater part of the day by rail or private conveyance.

In case of accidents which occur often in the larger mining camps, the Inspector or his Deputy must per force make an immediate inspection at whatever hour he may be notified.

While the Mine Inspector is almost continuously investigating the workings of mines throughout the State, the county of Silver Bow, where the greatest mining camp in the United States is located, should receive the constant attention of a Deputy Mine Inspector, for there new mines are being continuously opened, old mines more extensively developed, new improvements made, and general changes are going on every day.

I again return thanks for the courtesy and willing aid extended me by managers and others while prosecuting my examinations.

FATAL ACCIDENTS.

NAME.	DATE.	MINE.	COUNTY.	CAUSE.
Joseph Owens.....	December 1, 1893	Parrot.....	Silver Bow.....	Fell from cage down shaft.
James Bertoglio.....	December 2, 1893	Silver Bow.....	Silver Bow.....	Cave of rock in slope.
William H. Boase.....	December 29, 1893	Stevens.....	Silver Bow.....	Cave of rock in level.
John E. Johnson.....	February 28, 1894	Sand Coulee.....	Cascade.....	Blast in mine.
Robert Thornburn.....	May 1, 1894	Rocky Fork.....	Park.....	Cave of coal and top rock.
John Hvala.....	May 28, 1894	Cokedale.....	Park.....	Fall of coal from roof.
E. A. Boisford.....	May 14, 1894	Drumlummen.....	Lewis and Clarke.....	Fell down ore chute.
Andrew Harry.....	September 3, 1894	Sand Coulee.....	Cascade.....	Cave of draw slate.

NON-FATAL.

NAME.	DATE.	MINE.	COUNTY.	CAUSE.
John Hesford.....	December 23, 1893	Poulin.....	Silver Bow.....	Leg broken by rock.
Peter Larson.....	January 3, 1894	Fl. & H.....	Jefferson.....	Cave of rock.
John Jonnson.....	January 10, 1894	Rocky Fork.....	Park.....	Cave of rock.
George Wedge.....	June 15, 1894	Bald Butte.....	Deer Lodge.....	Leg broken by cave of ore.
Ed Brown.....	October 17, 1894	Iron Mountain.....	Missoula.....	Blast.

Fatal Accidents

SILVER BOW COUNTY.

JOSEPH OWENS. On December 1st, 1893, at five minutes to 12—midnight—Joseph Owens met with a horrible death at the Parrot mine in Butte.

At half past eleven while he was passing lagging up to his partner, Tom Melvin, on the second floor of a stope on the 700 foot level he complained of being sick, either from drinking too much water or using too much tobacco. At near 12 o'clock the men passed out to the station and waited for the up cage to take them to the surface for supper. Owens had been feeling a little better for a few moments but soon had another attack of sickness at the stomach. This wore off and the two men with four others got on the lower floor of the cage, grasped the safety bar and were rung up by Station Tender Tom Davis. When near the 300 level the men on both floors of the cage felt a sudden jar or halting vibration of the cage. The engineer also felt the vibration and hoisted very slowly to the surface, when Owens was missed. The shift boss and another man at once descended the east compartment shaft to the 700, where Davis and Johnson Rodda were taken on. They went down to the 800 and found Owens' body in the water on the east side of the shaft and his left leg, which had probably been torn off at the 300 level when he fell between the sets, lying on the west wallplate. His right leg was broken in two places, both arms were broken, the back of his skull crushed in and his brains entirely gone. The body was placed in a canvass and taken to the surface. Owens uttered no sound whatever when he fell, and the testimony of six men who were on the cage and who knew of his sickness while on the 700, substantiated the theory that he fainted while going up and fell off the floor.

JAMES BERTOGLIO. At 9 o'clock a. m. December 2d, 1893, James Bertoglio was instantly killed by a rock of porphyry-granite weighing 3,000 pounds falling from the roof above the face of a stope on the fourth floor of the 700 foot level, west, in Shaft No. 1 of the Silver Bow mine at Butte. Ten minutes before the accident William Gerrans, the shift boss, told Bertoglio and his nephew Dominic Bertoglio, to take down the rock which was but three feet ahead of the timbers and put in another set in order to be ready for the night shift. The rock had been loosened by a shot, and the elder man took a drill from his nephew, forced the point in to a crack and told his nephew to strike. He did so when the rock started, and before the man could take one step backward, it fell and caught him on the left side and back, throwing him to the floor. He must have begun turning around preparatory to getting out of the way, as his back was very badly scraped by the edge of the rock. All the ribs on his left side and the left arm at and above the elbow were badly broken. The right leg was also broken and the left foot which was caught under the weight, smashed.

Other miners who were working near came to the rescue and took the man to the surface. They said before the coroner's jury that all the ground was perfectly safe and that they would have done precisely as Bertoglio had done. The foreman, Joe Henworth, asked the jury to go down and examine the ground. The latter party of men were miners, summoned at the mine, and therefore capable of judging in such matters. They pronounced the place perfectly safe and rendered a verdict of purely accidental death from unavoidable causes. Everything about the mine appeared to be in perfect shape.

WILLIAM H. BOASE. On the afternoon of December 29th, 1893, W. H. Boase and Frank Stevens were at work in the lower part of a stope in the east drift of the 200 foot level, about 175 feet from the No. 2 shaft of the Stevens mine. W. J. Rodda, one of the partners in the lease on the property, left them about 3 o'clock and at 7:30, becoming anxious concerning the men, who failed to appear at their boarding house, went down the shaft ladder, entered the drift and found Stevens lying beside the hanging wall in an unconscious condition. A few feet further in lay a slab weighing about three tons and from underneath the edge protruded the feet of William Boase. Assistance was secured and Stevens taken to the surface, where he partially recovered. Stevens said that shortly after 3 o'clock Boase tapped, or sounded the walls preparatory to the work of cleaning up.

some loose dirt in the bottom of the drift at the base of stope. A few moments afterwards the slab mentioned above began falling from the hanging wall. Boase was in a stooping position directly underneath and could not possibly escape. Stevens was struck on the side of the head and left shoulder and knocked backwards. His shovel was broken and he struck the ground insensible. He lay in this condition until just previous to his discovery by Rodda, when he recovered and crawled to where he remembered having left a candle. He struck a light and a few moments afterwards fainted again from severe pain. Assistance was procured as soon as possible and after three hours hard work the body of Boase was extricated but life had fled. His face was buried in the soft dirt and many contusions and abrasions were noticeable. The left cheek bone was crushed in. No other bones were broken. He was undoubtedly instantly killed. The men were cleaning out the old workings preparatory to taking out ore. The accident was unforeseen and purely accidental.

PARK COUNTY.

JOHN HVALA. On May 28th a miner named John Hvala and his comrade, John Urbarcik, were at work in the face of the fourth level, 2,500 feet from the shaft, west, in the Cokedale mine getting ready to put in a set of timbers about ten feet from the face of drift. Hvala, who was nearest the hanging wall, was suddenly crushed to the floor by a fall of one and a half ton of coal. His right leg was broken in two places, the head and breast terribly bruised and other injuries sustained. Hvala died seven hours after the accident.

ROBERT THORNBURN. On May 1st this miner met with instant death while working on the bench in first entry, east, of the Rocky Fork Coal mine. He was at work with David Hawthorn and Jeff Dinsmore when the accident occurred. Hawthorn was preparing to put in a hole to blast and Thornburn was shoveling coal, when about ten tons of coal and top rock fell from the roof. The mass caught Thornburn, forced him to the floor and crushed his life out almost instantly.

This particular entry is about nine feet wide and was considered

perfectly safe in every respect by both men and company. In sounding the rock which fell, and which proved to be about two feet thick, it gave back no drumming sound to indicate it was loose, and hence the miners considered the ground solid and perfectly safe.

CASCADE COUNTY.

JOHN E. JOHNSON, a coal miner, was instantly killed on February 28th in room No. 1, fourth entry east, in the Sand Coulee Coal mines. Johnson and Antone Carlson, his working partner, had drilled two bottom holes, loaded them, lighted the fuse and retired to a safe distance. Only one shot exploded and after waiting for some time, Johnson, thinking the charge had missed fire in the second hole, returned to relight the fuse. As he approached the spot the explosion took place, resulting in his instant death.

ANDREW HARRY. On September 3rd Andrew Harry met with an accident in the Sand Coulee Coal mine which terminated fatally. At 8:30 a. m. while at work taking down loose coal in the face of room nineteen, sixth butt, eleventh south, Harry loosened a large flake of draw slate. When the coal came down the slate followed, striking Harry, and crushed him underneath. He was rescued by two other miners who were at work only twenty feet away from the place of accident. These fellow workmen assisted Harry to his residence, where he died on the morning of the 6th, three days later. Harry was employed as a miner but for the past two years has been with the company and had charge of a set of places as machine contractor.

LEWIS AND CLARKE COUNTY.

EDWARD A. BOTSFORD. In the Drumlummon mine on May 14th, a miner named Botsford was instantly killed by falling down the

stope above the 200 foot level on the North Star vein. It appears the shift boss, Thomas Reynolds, had told Botsford and his working partner, William Jewell, to put in a piece of timber used in rigging up a machine for use the day following. Jewell was taking down some loose dirt from the back of the north end of the stope. While thus employed Reynolds told Jewell there was some bad ground hanging over his head. Botsford said he would get a bar and take it down and immediately started after the implement while Jewell was working down the balance of the ground he had started on. Jewell, after a while, thought Botsford was gone a long time after the bar so he went and got it himself. Botsford not having returned when Jewell got back, search was instituted and his dead body was found sixty feet below with his neck broken. No one was present who could have seen the man fall, hence it is not known how the accident occurred.

The hole through which Botsford fell had been used for letting ore down and was two by three feet against the north wall, with a good gangway four feet wide on the south wall, thus giving plenty of room for a safe passage for men. It is surmised that Botsford's light went out and he stepped in the hole or slipped and fell into the stope below.

Non-Fatal

JOHN HESFORD. On December 24, 1893, John Hesford, while at work in the Poulin mine, near Walkerville, had his left leg broken above the knee. He was or had been trying to take down a rock weighing about fifty pounds from the top of a raise in the fifth stope on the 300 foot level, east, but not succeeding concluded it was safe enough to work under. The rock took a tumble a few moments subsequent with the above result.

PETER LARSON. While at work in the H. & H. mine at Winston, Jefferson County, on January 3d, Pete Larson had a narrow escape from death, yet received such severe injuries he was laid up for considerable time. He had gone into a raise on the second level about 1,000 feet from the main shaft. The raise was timbered to

within four feet of the top. Larson began sounding the ground when about two tons of it dropped upon the unlucky man, and while no bones were broken he was seriously bruised. Larson says he alone was to blame for the accident and would in all probability have been killed had he not been so close to the roof.

JOHN JOHNSON. This man had his right leg broken just above the ankle on January 10th while at work in room 37 in No. 6 mine of the Rocky Fork Coal Company. Johnson and Eric Ericson were drilling a hole preparatory to blasting when a slab of rock 3 by 4 feet by 4 inches thick fell in such a manner as to strike Johnson on the right leg, breaking the bone square in two.

No fault could be attached to the company as plenty of props and other timber are furnished for the miners' use and the room was timbered up as closely as practicable.

GEORGE WEDGE, on June 15th, while at work in the middle stope of the Bald Butte mine, Deer Lodge County, had his left leg broken above the knee. While putting down a piece of ore the mass got beyond his control and suddenly fell, striking a stull jumped over to the opposite side where Wedge was standing, hit his left leg and shattered the bone.

EDWARD BROWN. October 17th Ed Brown had an experience which very nearly cost him his life. He and Thomas Tighe had loaded a round of sixteen holes in the face of the drift of the twelfth level in the Iron Mountain mine, Missoula County.

They were prepared and all spitted but one, which refused to ignite, when Brown cut the fuse and tried again to light it. His partner discovered Brown was staying too long and shouted to him to run. At this moment one blast went off and knocked Brown to the floor. Before he could get to his feet the other fifteen shots were discharged and he was covered with fine dirt. Had the rock broken coarse he would probably have been instantly killed. As it was the man was only considerably bruised.

Mines.

BEAVERHEAD COUNTY.

THE FAITHFUL MINE, located at Bannack, is owned and operated by the Fathful Mining Company. H. B. Adsit is the superintendent and general manager and John Lenkensdorfer foreman. Fifteen miners and three topmen are employed. The mine is worked by a tunnel 400 feet in length, and timbered with tunnel sets. There are three exits; ventilation is good, and the character of ore is free gold.

THE POLARIS, of Bannack, is owned and operated by the Polaris Mining and Milling Company, under the direction of O. T. H. Allen, who acts as foreman, superintendent and manager. Eight miners and two topmen are employed. The mine is operated by a tunnel which is 1,800 feet in length, timbered with tunnel sets. The character of ore is silver, roasting and free. There are three exits, and ventilation is fair.

THE NEW DEPARTURE, at Dillon, is owned, operated and entirely supervised by L. A. Brown, who employes fifteen miners and two topmen. Mr. Brown has run a tunnes in 800 feet, which taps the vein at a perpendicular depth of 500 feet from the surface. The mine is timbered with square sete; the silver ore is taken out by tunnel ears; ventilation is excellent, and there are three exits from the mine.

HECLA CONSOLIDATED MINING COMPANY'S PROPERTIES.

The noted mines of this company are all under the direct management of H. Knippenberg, who is ably assisted by Superintendent S. A. Barbour.

THE ATLANTIS, situated at Trapper, employs seventy miners and ten topmen, who are under the supervision of Foreman D. H. McMaster. The mountain on which the mine is located is pierced by a tunnel 3,200 feet in length, timbered with tunnel sets. The character of ore is silver-lead (smelting) and is taken out by Ledgerwood engine and manilla rope attached to car. Brakes are used as safety appliances. Ventilation is good, and there are four exits.

THE CLEOPATRA and TRUE FISSURE mines are operated from the main working tunnel of the Atlantis. At a distance of 1,800 feet in from mouth of main tunnel a station has been cut and engines are set up and used for hoisting from the winzes. Two thousand eight hundred feet is the greatest depth so far attained in these mines.

THE CLEVE AND ARROW is under the foremanship of John Hull. At present but fourteen miners and three topmen are employed. The depth of the incline shaft is 1,425 feet, timbered with tunnel sets. The mode of hoist is a Frazer & Chalmers engine with manilla rope. Brakes are used as safety appliances. There are two exits; ventilation is excellent, and the character of ore is silver-lead, smelting.

The postoffice address of the Hecla Consolidated Mining Company is Glendale.

JEFFERSON COUNTY.

THE SUNLIGHT MINE, located at Whitehall, is owned and operated by W. J. Clark et al.; J. B. Starbird, superintendent and manager; Charles Seifert, foreman. Twenty-two miners and twelve topmen are employed. There are two double-compartment shafts on the mines, one 200 feet and the second 150 feet deep, timbered with square sets and stulls.

The mine is also opened by three tunnels, a length of 450 feet having been attained in No. 1. Tunnel sets are used in timbering.

The character of ore is gold, copper and silver. Hoisting is done with buckets in both shafts and $\frac{3}{4}$ inch steel ropes are in use,

handled by a single-cylinder Ottumwa, Iowa, Iron Works engine. There are three exits and ventilation is fair.

A shaft is being sunk in tunnel No. 2 at a distance of 420 feet from the surface or mouth. The greatest depth at this time (June 29) is 320 feet. Forty men are at present engaged in construction work.

THE ELKHORN, situated at Elkhorn, is owned and operated by the Elkhorn Mining Company, Limited; C. A. Molson superintendent and manager; William Davey, foreman. Eighty miners and twenty-two topmen are employed. The shaft is an incline, single-compartment, 1,975 feet deep, timbered with stulls. The character of ore is silver and lead. The mode of hoist is with double-decked skips, handled by a $1\frac{1}{8}$ inch steel rope and 30x60 cylinder Fraser & Chalmers engine.

There are no safety appliances in place; the ventilation is good; number of exits, two.

NOTE—The safety of every employe is carefully looked after by the management, hence there is but few accidents in or about the mine.

THE AUGO FRIE, situated at Winston, is owned and operated by Charles Clark and General Harris; O. A. Tibbits, superintendent and general manager; Brady Hanson, foreman. Forty-six miners and ten topmen are employed.

The mine is developed by a two-compartment shaft 275 feet deep and three tunnels respectively 2,800, 2,200 and 2,200 feet in length, timbered with stulls and tunnel sets. Character of ore, sulphuret gold. Mode of hoist, cages, $\frac{7}{8}$ inch steel rope, handled by Ledgerwood engine. Safety appliances are in place, tested once each month. Ventilation is good, and there are two exits.

One thousand three hundred feet south, on the 275 foot level, a winze or shaft is being sunk to the 375 foot level. Crosshead and bucket, a $\frac{7}{8}$ inch steel rope and Ledgerwood engine are at present being used.

THE ALTA, located at Alta, is owned and operated by the H. & L. S. & R. Co. O. R. Allen, manager; L. D. Davis, superintendent; Ole Lewis, foreman; 145 miners and fifteen topmen employed. The depth of shaft is 600 feet; length of tunnel,

3,500 feet, timbered with square sets and stulls. The character of ore is silver and lead. Mode of hoist, single-deck cage, $\frac{7}{8}$ inch steel rope, handled by electricity. Safety appliances are in place and tested each day. The exits are six in number, and ventilation good.

NOTE—The electric hoist in use at the Alta mine is located about 1,600 feet in No. 8 tunnel. It is the only electric hoist in the State of Montana.

THE LIVERPOOL, located at Clancy, is owned and operated by Merrill & Miller. T. G. Merrill, superintendent and manager; Alex Swan, foreman. Twenty five miners and nineteen topmen are employed. The shaft is two-compartment, 340 feet deep. The mine is timbered with stulls. Character of ore, silver and lead. Mode of hoist, single-deck cage, $\frac{3}{4}$ inch steel rope, 7x10 cylinder Griffith & Wedge engine. Safety appliances are in place and tested each week. Exits, three; ventilation, good.

THE WASHINGTON, located at Clancy, is owned by Merrill & Miller, operated by Grub, Hinton & Hogan. J. Grub, superintendent and manager; Martin Kennedy, foreman. Eighteen miners and twelve topmen are employed. The shaft is double-compartment and 250 feet deep. Stulls and half sets are used in timbering. Character of ore, silver and lead. Mode of hoist, bucket, $\frac{5}{8}$ inch steel rope, 7x9 cylinder Ledgerwood engine. Number of exits, two; ventilation, excellent.

THE KATIE, located at Basin, owned and operated by the Katie Mining Company, is under the direct management of James Glass; H. E. Emerson, foreman. Thirty miners and eight topmen are employed.

The depth of the west shaft is 240 feet, is two-compartment and timbered with square sets. Character of ore, gold and silver. Buckets and $\frac{7}{8}$ inch rope, handled by an 8x15 cylinder Ledgerwood engine, are used in hoisting. There is but one exit, and ventilation is poor.

The east or main shaft is double-compartment, 300 feet deep, timbered with square sets. Single-deck cage, 1 inch steel rope, handled by a 14x18 cylinder Ledgerwood engine, are used in hoisting.

NOTE—Ventilation is not good owing to the fact that connec-

tions have not been made between east and west shafts. Levels are being driven from either shaft to connect and as soon as completed fresh air will be plentiful.

THE HOPE, located at Basin, owned and operated by the Hope Mining Company; F. M. Fletcher, manager; G. F. Kellogg, superintendent and foreman, employes fifty-one miners and ten topmen. The shaft is two-compartment, 272 feet deep, timbered with square sets and stulls. The character of ore is gold and silver. Bucket and 1 inch steel rope, handled by an 8x14 cylinder engine, are used in hoisting. There are two exits, and ventilation is good.

NOTE—A tunnel was run to the main vein at the time of original discovery and strikes the present shot at a depth of seventy-two feet from the surface.

MADISON COUNTY.

THE CLIPPER MINE, situated near Pony, is owned and operated by Morris & Elling. W. W. Morris is superintendent and manager; James Rooney, foreman. Eight miners are employed under ground and two men on top.

Three tunnels, 700 feet each in length, have been run and tunnel sets are used throughout their entire depth. There are three exits; ventilation is good and the character of ore free milling gold.

THE BOZEMAN, located near Pony, is owned by Alex McKittrick and operated by D. N. Upton of Butte. J. J. Sarnett is superintendent and manager, and controls the working of the property. But five men are employed at present. The mine is developed by a tunnel 287 feet long, protected by tunnel sets. The tunnel taps the lead of free milling gold ore at a depth of 130 feet from the surface. There are two exits and ventilation is fair.

THE ATLANTIC AND PACIFIC MINE, near Pony, owned by Morris & Elling, is operated by C. H. Hand, who also manages and supervises the entire workings. H. S. Kingsbury is foreman. But

four men are employed at present. The tunnel is 500 feet long, timbered with tunnel sets. The character of ore is concentrating gold; number of exits from mine two; ventilation fair.

THE MOHEGAN MINE at Red Bluff, is owned and operated by Elling & Stewart. Charles Stewart acts as foreman, superintendent and manager, respectively. Six miners are employed under ground and four men on top. The mine has been developed by a two-compartment shaft 110 feet deep, timbered by shaft sets. The character of ore is free gold and is hoisted with a Ledgerwood friction engine and $\frac{5}{8}$ inch steel rope with crosshead appliances. The number of exits is two and ventilation is good.

THE EASTON MINE, near Virginia City, is owned and operated by Fine & Pankey. Henry Pankey acts as superintendent and general manager; Hugh O'Donal as foreman. Twenty-seven miners are employed under ground and twelve men on top. The main tunnel is in 1,175 feet, is timbered with tunnel sets and has a good track laid the entire length. The character of ore taken out from this mine is concentrating gold and silver, hauled out on cars by mule power. There are three tunnels along the vein, all connected with raises from different points. Ventilation is good and there are three exits from the main tunnel.

THE MONITOR MINE, near Norris, is owned and operated by the Monitor Gold Mining Company. S. K. Knox is superintendent and manager; A. McKennon, foreman. Five miners are employed below and three men on top. The property is opened by a tunnel 310 feet long and a single-compartment shaft fifty feet deep, timbered with tunnel sets and square sets. The gold smelting ore is hoisted by windlass. There are three exits from the tunnel and ventilation is good.

NOTE—At a distance of 150 feet from the mouth of tunnel a surface shaft has been sunk to connect with tunnel. From this point the company have run a crosscut twenty feet north, tapped the vein and sunk a winze twenty-five feet, making the total depth attained seventy-five feet from surface.

THE SILVER BELL at Virginia City, owned by Henry Elling, operated by Fine & Pankey with Henry Pankey as superintendent and manager and J. A. Doran foreman, is working seven men below

and two on top. The depth of shaft is 140 feet. The character of ore is concentrating gold and silver. Hoisting is done with bucket and crosshead safety appliances by an Eart & Bacon engine and $\frac{5}{8}$ inch steel rope. There are two exits and ventilation is fair.

THE LEITER MINE, near Sderidan, is owned and operated by Leiter & Co. J. B. Leiter is general manager; J. J. Rosenberger, superintendent; J. Lewis, foreman. Forty-five miners and seven top men are employed. The mine is opened by a two-compartment shaft 175 feet deep and a tunnel 1,550 feet long, timbered with tunnel sets. The mine produces concentrating gold ore. Hoisting is done by a Dubuque engine and $\frac{3}{4}$ inch steel rope. There are three exits by tunnel and ventilation is good.

At a distance of 1,050 feet from the mouth of tunnel a steam hoist has been erected in the mine. A shaft is being sunk from this point and a Dubuque engine is in daily use for hoisting.

The ore from this mine is taken directly from the mill by an aerial tramway 3,000 feet in length.

MEAGHER COUNTY.

THE BROADWATER MINE, located at Neihart, is owned and operated by W. J. Clark. John McCooney is foreman, superintendent and general manager. Eighty-five miners and twenty-eight top-men are regularly employed. The property is worked through a 1,600 foot tunnel, well timbered with tunnel sets. There are three exits.

The Broadwater is opened up by three tunnels, the St. Julien, 1,600 feet long; the Dickens below the St. Julien, in 1,200 feet; and the Clark, yet below the Dickens, now in 200 feet. The two upper ones run in on the vein.

MISSOULA COUNTY.

THE IRON MOUNTAIN MINE, near Pardee, is owned and operated by the Iron Mountain Mining Company. William Coin is superintendent and manager and Robert Angus foreman. There are eighty miners and fifteen topmen regularly employed. The main shaft is two-compartment, 500 feet in depth and well timbered. The mine is also opened by a tunnel now in 1,100 feet and timbered with tunnel sets. Hoisting is done with cage, by Ledgerwood engine and 1 inch steel rope. Safety appliances are in use and are tested each week. The mine has four exits. At a distance of 700 feet from mouth of tunnel a shaft has been sunk to a depth of 500 feet. This gives a 1,200 foot actual development of the mine.

THE GOLDEN EAGLE, located at Murtina, is owned and operated by the Nine Mile Mining Company. J. W. Woodford is superintendent and general manager; Ed Collins, foreman. Eighteen miners and four topmen are employed. The mine is opened up by a single-compartment shaft 230 feet deep and a tunnel 519 feet in length, timbered with tunnel sets. The character of ore is free milling gold. There are three exits and ventilation is good.

NOTE—The ore of this mine is sent by a tramway 1,100 feet long to the ten-stamp mill, where it is reduced.

LEWIS AND CLARKE COUNTY.

THE DRUMLUMMON MINE, located at Marysville is owned and operated by the Montana Company, Limited. R. G. Baylis is general manager; Alex Burrell, superintendent; and Isaac Warren, foreman.

There are working below forty-two miners, forty-one miners' laborers, twenty-two timbermen and two pumpmen under the orders of three foremen.

Two engineers, six smiths and strikers, fourteen trammers and fifteen general laborers are employed on top.

The main shaft is three-compartment and has attained a depth of 1,600 feet.

The length of tunnel is 1,200 feet. Timbering is done with stulls and square sets. The character of ore is a combination and free milling gold and silver. Hoisting is done with cage, handled by a Fraser & Chalmers Corliss engine and $\frac{1}{2} \times 5$ inch steel rope. Safety appliances are in place and are tested once a week. Ventilation is excellent, and there are six exits.

DEER LODGE COUNTY.

THE ONTARIO MINE, located near Elliston, is owned and operated by the Ontario Mining Company. William Dyer is superintendent and manager; William Jobe, foreman. Thirty miners are employed below and sixteen men on top.

The main shaft is two-compartment and has attained a depth of 290 feet. The tunnel entering the mine is in 600 feet and timbered with half sets. The character of ore is gold and silver. The mode of hoist is with crosshead and bucket, handled by a Ledgerwood engine and $\frac{3}{8}$ inch steel rope. There are no safety appliances. Ventilation is good, and the mine has two exits. The shaft is situated 200 feet in the drift on the vein and 800 feet from the mouth of the tunnel.

THE PENOBSKOT, located at Bald Butte, is owned and operated by Longmaid Brothers. Frank Longmaid is superintendent and manager; Henry Northey, foreman. Sixteen miners and two topmen are employed. The single-compartment shaft is down 500 feet and timbered with stulls. The character of ore is free gold. The mode of hoist is with skip, handled by a Fraser & Chalmers engine and $\frac{7}{8}$ inch steel rope. There are three exits, and ventilation is good.

THE BALD BUTTE, located at Bald Butte, is owned and operated by the Bald Butte Mining Company; B. H. Tatem, manager; Thomas Sincock, superintendent; P. J. Sincock, foreman. Thirty-two miners and two topmen are employed. The mine is operated through a tunnel 1,250 feet long, timbered with stulls. Tunnel cars

are used. The character of ore is free gold, the number of exits three, and the ore of the mine is reduced in a forty-stamp mill situated one mile below the mine.

GRANITE COUNTY.

THE AETNA MINE, located at Royal, is owned and operated by the Royal Gold and Silver Mining Company. W. Bennett is superintendent and manager; J. D. Fletcher, foreman. Fifty miners and ten topmen are employed. The mine is operated by a tunnel 1,200 feet in length, timbered with stulls. The character of ore is free gold, and the mine has two exits.

THE BI-METALLIC, located at Philipsburg, is owned and operated by the Bi-Metallic Mining Company. W. Thomas Hart is manager; James Willoughby, superintendent and foreman. Thirty-six miners and nine topmen are employed. The mine is operated by shafts and tunnels. The main shaft is down 600 feet. The tunnels are in 800 feet west, 875 feet east and are timbered with tunnel sets. The mode of hoist is with cage, handled by a Webster & Lane 12x14 Campbell engine and 1 $\frac{1}{4}$ inch steel rope. Safety appliances are in use and tested monthly. There are two exits, and ventilation is excellent.

The great tunnel is being run as a drain from the Bi-Metallic and Granite Mountain mines.

THE HOPE MINE, located at Philipsburg, is owned and operated by the Hope Mining Company. N. B. Ringling is manager and superintendent; Henry Reyfeldt, foreman. Twenty-six miners and twelve topmen are employed. The mine is operated by a two-compartment shaft 300 feet deep and a tunnel 1,700 feet in length, timbered with square sets. The mode of hoist is with bucket and cross-head, handled by a Fraser & Chalmers 7x10 friction engine and 3/4 inch steel rope. There are five exits, and ventilation is good.

NOTE--The shaft is located 960 feet in the main tunnel.

SILVER BOW COUNTY.

THE ANACONDA SYNDICATE.

This company own and operate the Anaconda, St. Lawrence, High Ore, Mountain Con. and Green Mountain, five of the best producing copper-silver mines in the world. Marcus Daly is general manager of all the Anaconda Mining Company's properties. These mines are located at Butte.

THE ANACONDA, M. J. O'Farrell, assistant manager; John O'Neil, superintendent; P. Regan, foreman; employs constantly from 430 to 450 miners and about eighty topmen. The depth of the main shaft is 1,200 feet. It is three-compartment and timbered with square sets. The character of ore is copper-silver. The mode of hoist is with double-decked cages, handled by a 20x60 I. P. Morris engine and $\frac{1}{2} \times 6$ inch flat rope. Safety appliances are in use and tested with three tons weight each week. The number of exits from mine is four and ventilation is fair.

NOTE—While the ventilation in the mine is as good as necessary, the temperature is very high in some places, especially east of the main shaft. That portion of the mine west of the main shaft is cooler and better ventilated.

THE ST. LAWRENCE, adjoining the Anaconda on the east, M. J. O'Farrell, assistant manager; John O'Neil, superintendent; John Kane, foreman; employs 265 miners and twenty-seven topmen. The main shaft is three-compartment and has attained a depth of 1,150 feet. It is timbered with square sets; the character of ore is copper-silver; the mode of hoist by double-decked cages handled by a 20x60 Prescott engine and $\frac{1}{2} \times 6$ inch steel flat rope. Safety appliances are in use and are tested three times each week. The number of exits is four and ventilation fair.

NOTE—The St. Lawrence is also fairly well ventilated, but throughout the mine the temperature is somewhat higher than in the Anaconda.

THE HIGH ORE, assistant manager, M. J. O'Farrell; superintendent, John O'Neil; foreman, John O'Neil; works 294 miners and

twenty-seven topmen. The main shaft is three-compartment, 1,200 feet deep and timbered with square sets and stulls. The character of ore is copper-silver. Mode of hoist is with double-decked cages, handled by a 20x48 _____ engine and $\frac{1}{2} \times 4\frac{1}{2}$ inch steel flat rope. Safety appliances are used and tested each day. There are five exits and ventilation is good.

THE MOUNTAIN CON., M. J. O'Farrell, assistant manager; Larry Manning, superintendent; James Keegan, foreman; now has 347 miners and forty-seven topmen at work. The main shaft is three-compartment, 900 feet deep and timbered with square sets. The character of ore is copper-silver. Mode of hoist is with double-decked cages handled by a 20x60 T. P. Morris engine and $\frac{1}{2} \times 6$ inch steel flat rope. Safety appliances are in use and tested twice each week. There are three exits and ventilation is good.

Six hundred feet west of the main shaft is Shaft No. 2, now down 700 feet and sinking continuously going on.

NOTE—The safety of the men is well looked after throughout this entire mine.

A magnificent new engine for hoisting purposes with 20x48 cylinders, built by Webster, Camp & Lane of Akron, Ohio, is being placed in position here.

THE GREEN MOUNTAIN, Joseph Laird, superintendent; John O'Mara, foreman; has 275 miners and twenty-five topmen at work. The main shaft is three-compartment, 1,000 feet deep. The mine is timbered with square sets. Character of ore copper-silver. Mode of hoist double-decked cages, handled by an 18x48 cylinder engine and $\frac{1}{2} \times 5$ inch flat steel rope. Safety appliances are in use and tested each week. There are three exits and ventilation is good.

THE PARROT MINE, of Butte, is owned and operated by the Parrot Mining Company, J. E. Gaylord, manager; Ben Tibby, superintendent; Matt Hodge, foreman; number of miners, 101; number of topmen, twenty. The shaft is double compartment, 900 feet deep. The mine is timbered with square sets. Character of ore copper-silver. Mode of hoist double-decked cages, handled with 10x60 Fraser & Chalmers engine and $\frac{3}{8} \times 5\frac{1}{2}$ inch steel flat rope. Safety appliances are in use and tested each week. Number of exits two; ventilation excellent.

THE VIRGINIUS is another Parrot Company property but is under lease to D. G. Bricker, who acts as foreman, superintendent and manager. He employs fifty miners and top-men. The shaft is double-compartment and down 300 feet, and timbered with sets and stulls. Character of ore copper-silver. Mode of hoist is with bucket handled by an $8\frac{1}{2} \times 10$ link-motion, slide valve engine and 1 inch steel rope. There are two exits and ventilation is good.

THE BLUE JAY MINE of Butte, is owned by the Thornton estate and operated by the B. & B. Mining Co. James Hoatson is manager and superintendent; L. K. Merrill, foreman. Forty-five miners and eight topmen are employed. The main shaft is double-compartment, 450 feet deep. The mine is timbered with square sets, stulls and half sets. Character of ore copper-silver. Mode of hoist single deck cages, handled by 9×11 link-motion engine and $\frac{7}{8}$ inch steel rope. Safety appliances are in use and tested each week. There are two exits and ventilation is good.

THE COLUSA PARROT of Butte, is owned and operated by W. A. Clark; A. H. Weathy, manager; R. G. Brown, superintendent; S. Kilgallon, foreman. Ninety-seven miners and twelve topmen are steadily at work. The mine is operated through a double-compartment shaft 300 feet deep, timbered with square sets. Mode of hoist single deck cage, handled by a 16×30 inch cylinder Corliss engine and $\frac{1}{2} \times 4$ inch steel rope. Safety appliances are in use and tested each week. Character of ore copper-silver. There are two exits and ventilation is good.

NOTE—The hoisting engine mentioned in the above report was manufactured in Butte by the Montana Iron Works Company. It is a complete piece of machinery, perfect in its every part and detail. It not only reflects credit upon the makers but is an honor to the State.

THE POULIN MINE, of Butte, is being operated by W. H. Edwards and Co., the members acting in an official capacity in all matters pertaining to the working of the mine. Twenty-one miners and three topmen are steadily at work. The shaft is double-compartment, 400 feet deep. The mine is timbered with stulls and sets. Character of ore silver-copper. The mode of hoisting is by bucket and crosshead, handled by a 6×10 geared engine and 1 inch steel rope. There are two exits and ventilation is good.

NOTE—The Poulin has but recently been leased to the present

operators. The shaft is at present out of plumb but is to be straightened so as to permit the running of a cage, which will be introduced.

THE WEST PACIFIC, owned by the Davis estate, is under lease and operated by P. J. Handlin, who controls the men and directs the workings of the mine. There are six miners and three top-men employed. A two-compartment shaft 150 deep feet has been sunk and is timbered with square sets and stulls. The character of ore is silver-copper. Hoisting is done with bucket, handled by a 6x8 Ottumwa Iron works engine and $\frac{5}{8}$ inch steel rope.

THE EAST PACIFIC is also owned by the Davis estate. It is under lease, operated by and under the sole management of M. F. Kennedy. Ten miners and three top-men are employed. The shaft is single-compartment and down 300 feet. Stulls are used in timbering. Hoisting is done with bucket, handled by a 6x8 cylinder geared engine and $\frac{3}{4}$ inch steel rope. There are five exits from mine and ventilation is good.

THE CARRIE is owned by J. A. Murray & Co. The mine is operated and managed by Frank Bateman; T. H. Williams, foreman. There are nineteen miners and five topmen at work. The shaft is two-compartment, 350 feet deep. Timbering throughout the mine is done with stulls and square sets. Character of ore copper and silver. Bucket is used in hoisting by $\frac{3}{4}$ inch stdel rope, handled by a 10x12 cylinder Webster, Camp & Lane engine. There are five exits from mine and ventilation is good. A skip will be put in the shaft at an early day.

THE ALICE, located at Walkerville, is owned and operated by the Alice Gold and Silver Mining Company. W. E. Hall is superintendent and manager; Nick Tregear, foreman. At present but seventeen miners and five topmen are employed. The main shaft is three-compartment, 1,500' feet deep. Square sets and stulls are used in timbering. Character of ore gold and silver. Single deck cages are used for hoisting with $\frac{1}{2}$ x 4 inch steel flat rope, handled by an 18x48 Fraser & Chalmers engine. Safety appliances are in place and tested every two weeks. Number of exits from mine four; ventilation good.

THE GAGNON MINE, Butte, is operated by the Colorado Smelting and Milling Company. C. W. Goodale, manager and superin-

tendent; John Hewett, foreman. Ninety miners and twenty-two top men are continually at work. The main shaft is three-compartment, 1,215 feet deep. Square sets and stulls are used in timbering. Hoisting is done with skips and 1 inch lock steel rope, handled by a 22x26 C. direct acting engine. Safety appliances are in place and tested twice each month. There are two exits from the mine.

THE BUFFALO WEST, Butte, owned by the Anaconda Company, is under lease to and operated by Heinze & Finlen. Miles Finlen is superintendent and manager; Pat O'Neil, foreman. Thirty-nine miners and six top-men are employed. The shaft is double-compartment, 500 feet deep. Square sets and stulls are used in timbering. The character of ore is copper and silver. Hoisting is done with single deck cage and $\frac{3}{4}$ inch steel rope, handled by a $7\frac{1}{4} \times 12$ inch cylinder, Ottumwa, Iowa, engine. Safety appliances are in place, tested each week and there are three exits.

THE STEWARD MINE, Butte, is owned by Clark Brothers and operated by W. A. Clark. A. H. Weathy, manager; R. G. Brown, superintendent; Tom Bryant, foreman. Fifteen miners and six top-men are employed. The shaft is two-compartment, 330 feet deep. Stulls are used for timbering. The character of ore is copper-silver. Hoisting is done with skip and $\frac{7}{8}$ inch steel rope, handled by a 10x12 cylinder Ledgerwood engine. Safety appliances are in use and tested each week. There are two exits from 200 level.

THE EAST COLUSA of Butte, is owned and operated by the Boston and Montana Mining Company. Thomas Couch, superintendent and manager; Josiah Gilbert, foreman. Forty miners are employed in the under ground workings and thirty men on top. The main shaft is three-compartment, 600 feet deep, timbered with square sets. Character of ore copper and silver. Mode of hoist is with double decked cages, $\frac{1}{2} \times 4\frac{1}{2}$ inch steel flat rope, handled by 19x49 inch cylinder A. P. Allis & Co. engine. Safety appliances are in place and are tested each week. Ventilation is good and there are four exits from the mine.

THE WEST COLUSA of Butte, is owned and operated by the B. & M. Mining Company. Thomas Couch is superintendent and manager; Josiah Gilbert, foreman. Ninety miners and twelve top men are regularly employed. The main shaft is three-compartment, 600 feet deep. The mine is timbered with square sets. Character of ore

copper-silver. Double decked cages are used in hoisting with 1 inch steel rope, handled by a 10x12 double cylinder geared engine. Safety appliances are in place and are tested each week. Ventilation is good and there are four places of exit from the mine.

THE GAMBETTA of Butte, owned, operated and managed by John A. Leggett, John Renfrey foreman, employs sixteen miners and six topmon. The mine is worked through a two-compartment shaft, 550 feet deep, timbered with square sets. Character of ore copper and silver. Hoisting is done with single decked cage and $\frac{7}{8}$ inch steel rope, handled by an 8x10 cylinder Ledgerwood engine. Safety appliances are in place and tested each week. Ventilation is fair and there is but one exit.

NOTE—An upraise from the lower level to the surface is now being made and the mine will soon have two places of exit and good ventilation.

SILVER Bow No. 1 and SILVER Bow No. 2 are owned and operated by the Butte and Boston Mining Company. C. H. Palmer, manager; James Hoatson, superintendent; Joseph Henworth, foreman.

No. 1 is operated by a three-compartment shaft 1,000 feet deep, timbered with square sets. Two hundred and forty miners and eight top-men are regularly employed. The character of ore is copper and silver. Single decked cages are used for hoisting, handled by a $\frac{1}{2}$ x4 inch steel flat rope and 16x42 cylinder E. P. Allis engine. Safety appliances are in place and tested each day. Ventilation is good and there are four places of exit.

No. 2 employs eight miners and four top-men. It is a two-compartment shaft to the 200 level and three-compartment from the 200 to the 700 foot level, the lowest depth attained. The mine is timbered with square sets. Character of ore copper and silver. Single department cages are used in hoisting with $1\frac{1}{8}$ inch steel rope, handled by an 8x12 cylinder Pacific Iron works engine. Safety appliances are in place and tested each day. Ventilation is good and there are four places of exit.

THE BELMONT, of Butte, is owned and operated by the M. O. P. Co. F. A. Heinze, superintendent and manager; J. M. Rowe, foreman. There are at present (Nov. 27th) twelve miners and four top-men employed. The shaft is two-compartment, 400 feet deep,

timbered with stulls and the character of ore copper and silver. Single deck cages are in use for hoisting with $\frac{3}{4}$ inch rope, handled by an 8x10 cylinder Chicago Iron works engine. Safety appliances are in place and tested every week. Ventilation is fair and so far there is but one exit.

NOTE—As yet there has been no stoping done in the Belmont, but crosscutting is in progress and as soon as a sufficient distance is run on the different levels raises will be made to the surface, thereby providing several means of exit and good ventilation.

THE GLENGARRY, owned and operated by the M. O. P. Co., is managed by F. A. Heinze; J. M. Rowe, foreman. Sixty-six miners and fifteen topmen are employed. The main shaft is two-compartment to the 400 foot level, and from that point to the bottom (135 feet) three-compartment. Square sets and stulls are used in timbering. The ore produced is copper and silver. Single decked cages and $\frac{7}{8}$ inch steel rope, handled by a 9x15 cylinder Pacific Iron works engine are used for hoisting. Safety appliances are in place and tested every week. Ventilation is good and there are two places of exit.

Coal.

CASCADE COUNTY.

BELT No 1. is located at Belt and is owned and operated by the Castner Coal and Coke Company. James Shields, manager; P. J. Shields, superintendent; H. Williams, foreman. Ninety-six miners and four topmen are steadily employed. The mine is opened up by levels and is well ventilated by furnace and shaft. Four hundred tons of semi-bituminous coal are extracted daily. There are two exits, and the mine is free from explosive gasses.

BELT No. 4 is located at the same place as Belt No. 1, is owned and operated by the same company with the same gentleman for manager and superintendent as No. 1. Peter Franklin is the very efficient foreman. Eighty-five miners are employed in the workings and ten topmen look after the top work. The mine is worked from levels and yields a daily product of 300 tons of semi-bituminous coal. So far no explosive gasses have been detected. Ventilation is had by means of furnace and shaft, and the number of exits are two.

THE MILLARD, located at Belt, is owned by H. Millard. E. J. Lowery operates the property and fills the positions of foreman, superintendent and general manager. He employes sixteen miners and sixteen topmen. The mine is worked by level, has but two exits, is ventilated by furnace and shaft and produces sixty tons of semi-bituminous coal daily. No explosive gasses have been detected.

THE LEWIS MINE, located at Belt, is owned, operated and managed by Frank Lewis. Mr. Evans, as foreman, has charge of the nineteen men employed. Sixty-five tons of semi-bituminous coal is taken out daily from the level. Ventilation is had by furnace and shaft, and no explosive gasses have been detected.

THE SAND COULEE, located at Sand Coulee, owned and operated by the Sand Coulee Coal Company, is officered by Henry Burrell as superintendent and manager and Thomas Lindsay as pit boss. One hundred and thirty-five miners and ninety topmen are regularly employed. The mine is operated directly on the veins by drifting from the surface. Two thousand five hundred tons of semi-bituminous coal is taken out daily, but the mine has a capacity of 4,000 tons. There are two exits, and ventilation is furnished by two fans. Over 400 cubic feet of air per minute is furnished to each man. No explosive gasses have as yet been discovered.

NOTE—This mine is most excellently equipped and well managed. The estimated amount of track under ground covers nearly forty miles of distance.

PARK COUNTY.

RED LODGE COAL MINE, located at Red Lodge, is owned and operated by the Rocky Fork Coal Company and managed by J. M. Fox. William O'Connor is superintendent and Martin Wood fire boss. Two hundred and forty miners and fifteen topmen are employed. The character of coal is semi-bituminous and 800 tons per day is taken from drifts and slope, though the capacity is 1,200 tons per day. The mine is well ventilated by fans, which furnish 265 cubic feet of air per minute to each man and 600 cubic feet per minute for each mule. There are three exits, and no explosive gasses have as yet been detected.

LIVINGSTON COKE AND COAL MINE, of Cokedale, owned and operated by the Livingston Coke and Coal Company, is managed by O. R. Allen with G. I. Weeks as superintendent and D. Morgan, foreman. Ninety-six miners and twenty-one topmen are employed regularly. The mine is worked to its fullest capacity, 200 tons of semi-bituminous coal being taken from the slope every day. There are two exits. The volume of air furnished by fan amounts to 157 cubic feet per minute for each man and 600 feet for each mule.

GALLATIN COUNTY.

THE TIMBERLINE COAL MINE, located at Timberline, is owned by the N. P. R. R. Co. and operated by C. W. Hoffman. G. B. Hoffman is manager, James Anderson superintendent and Thomas Atherton pit boss. Seventy-five miners are regularly employed. The mine is worked from slope and 200 tons of semi-bituminous coal extracted daily. This amount is the full capacity of the mine. Explosive gasses have been detected. The ventilation is fairly good, there being 150 cubic feet of air per minute furnished each man and 600 cubic feet per minute supplied to each mule. The supply is furnished by fan. There are two exits from the mine.

THE CHESNUT, owned by the Chesnut estate, is operated by McCarthy & Johnson and these gentlemen superintend all the workings. The mine is opened by tunnel, employes sixty miners and four topmen. It is ventilated by tunnel and shaft and a sufficient volume of fresh air is furnished for every purpose. No explosive gasses exist. The mine is worked to its full capacity and produces 160 tons of semi-bituminous coal daily.

Col. C. S. Shoemaker, State Mine Inspector, Helena, Montana:

I herewith submit my First Annual Report, dating from the 7th day of February to the 1st of December, 1894. In the main it consists of accidents, fatal and non-fatal.

The improved methods of mining over that of past years accounts for the decrease of fatal accidents as compared with the increase of miners employed.

I find the major portion of non-fatal accidents and a considerable number of those where death has ensued are due to the carelessness of the men who were injured.

I have inspected very many mines in this district and notice a decided improvement in the care exercised for protection of life and limb.

In nearly all cases where fatal accidents have occurred I have reached the locality very shortly after the occurrence, inspected the place carefully and subsequently attended the coroner's inquest, thereby gleaning information through the sworn testimony of eye witnesses and others who were present immediately after the accident.

I also submit a list of the different mines which I have inspected with a view of reporting the same to you.

Trusting this report will prove satisfactory to you and be acceptable to His Excellency, the Governor, I have the honor to be

Your Obedient Servant,

JOHN MILES,

Deputy State Mine Inspector.

Butte, Montana, December 1, 1894.

Suggestions.

I desire to call attention to the necessity of a greater protection for those who daily enter the mines by cage. Some means should be adopted for the perfect safety of employes who are compelled to go down into the mines not less than twice each shift and the many who descend not less than twelve or fifteen times every day.

I have considered this matter carefully as a practical miner and also after consultation with several managers of large experience and am of the opinion that a simple and inexpensive devise may be put into practical use. I think all cages could be guarded with a permanent net work of wire, not less than three and one-half feet in height on either end, and wire net-work doors the full width of the cage for either side. These doors could be opened outward and closed again as easily as the bar can be lifted and put down, provided the floor of cage does not stop below the level of stations.

The net work should be attached to a sheet iron plate not less than six inches in width which would be a part of the door or ends and would rest on the floor of cage when in motion. This plate would prevent any pieces of rock or ore that might fall from the cars from rolling off the cage floor with the possibility of injuring men who might be in the shaft below.

The net work guard would prove a positive precautionary measure against the possibility of anyone falling off the cage when going up or down the shaft.

I would refer you to the terrible calamity which occurred in the Anaconda mine November 3, 1891, where nine men lost their lives by falling from the cage when going to the surface. It appears that one man fainted while going up and by his fall and the attendant excitement eight others were thrown between the cage and wall plates and so horribly crushed that death probably ensued before their bodies

went tumbling down the shaft, colliding with timbers until they reached the bottom in a fearful mutilated condition.

I also cite you to the accident in the Parrot and a third in the Mountain View, only a few months since, where from some unknown cause the men fell between the cage and wall plate, then to the bottom of the shaft, thus meeting an awful death.

Had a protective net work been in place on the cages eleven lives would not have been lost. If properly constructed and placed in position the doors will not interfere with the lowering of timbers or empty cars any more than in hoisting men, while the time consumed in opening and closing of doors would not be apparent.

IMPORTANT SECTIONS.

I would urge upon you to request the Governor to lay before the next Legislative Assembly the necessity of their making provision for the printing, upon suitable cards, Sections 7, 9, 10, 11, 1508 and 1509 of the Mining Laws of the State of Montana, the same to be subject to the order of the State Mine Inspector. Also have embodied in the law a clause making it mandatory upon the Mine Inspector to post or have posted one card of such printed sections upon the gallows frame of each mining shaft in actual use, where they may be easily seen and read.

FINGER BOARDS.

I would also call your attention to the necessity for a law requiring that finger boards, indicating the direction to different exits from the mine, should be placed at points or places in each level where they may be readily seen by all employes or others who may have occasion to escape from the mine in case of danger by flood or fire.

Finger boards are at present put up in the Gagnon mine and are being placed in the Mountain View. My object in making this needed suggestion arises from the fact that very many of the employes are total strangers to the under ground workings of our larger mines whose levels, drifts, crosscuts and stopes are so numerous and of such magnitude that it would require an incalculable amount of time for one to familiarize himself with all of them.

Finger boards would be a guide without a perfect knowledge of

the vast net work of excavations; and yet again, I would also suggest that the superintendents of the larger mines see to it that every under ground man employed be made to go through these several exits at least once a month that he may learn every opening from the mine.

I will cite you to the recent accident by flooding in the Glengarry mine. Many of the employes did not know where the exits were. Had finger boards been in place throughout the mine the probability is that Morgan and Currie would have escaped.

I should be derelict in my duty did I close my report without expressing my appreciation of the many acts of assistance rendered me by the managers, foremen and shift bosses during my examination and inspection of mines, and I therefore thank them for their valuable aid.

FATAL ACCIDENTS.

NAME.	DATE.	MINE.	COUNTY.	CAUSE.
William Wills.....	23, 1891	Pennsylvania.....	Silver Bow.....	Fell down ore chute.
James Proctor.....	February 3, 1891	St. Lawrence.....	Silver Bow.....	Fell down ore chute.
Samuel Couch.....	April 13, 1891	Mountain Con.....	Silver Bow.....	Crushed by fall of ore from roof.
Richard Prout.....	April 17, 1891	Mountain View.....	Silver Bow.....	Fell off the cage.
Thomas Wills.....	April 19, 1891	Pacifice.....	Silver Bow.....	Fell off the bucket.
James O'Brien.....	May 9, 1891	Anaconda.....	Silver Bow.....	Fell off ladder and down shaft.
Richard Hocking.....	June 7, 1891	Magna Charta.....	Silver Bow.....	Cave from roof of stope.
Samuel Rundle.....	June 11, 1891	Grey Rock.....	Silver Bow.....	Fell through floor of stope.
Michael Brady.....	August 1, 1891	Glengarry.....	Silver Bow.....	Water from Belmont mine broke through face of
James Morgan.....	August 1, 1891	(Glengarry.....	Silver Bow.....	{ 100 west level and flooded Glengarry mine, man
Joseph Currie.....	August 1, 1891	Glengarry.....	Silver Bow.....	drowned.
John H. Murray.....	August 25, 1891	Belle of Butte.....	Silver Bow.....	Ladder broke, Murray fell down shaft.
William Laughlin.....	September 26, 1891	High Ore.....	Silver Bow.....	Caught between cage and wall plate Sept. 15.
Patrick Lyons.....	October 20, 1891	Anaconda.....	Silver Bow.....	Caught between cage and wall plate.
John G. Nicholson.....	October 23, 1891	Mountain Con.....	Silver Bow.....	Dropped from 700 to 900 level on cage and afterward crushed between cage and wall plate as cage was raised from air bulk head.
Joseph Souve.....	November 16, 1891	Virginia.....	Silver Bow.....	Cave from roof of stope.
Bernard Plister.....	February 18, 1891	Atlantis.....	Beaverhead.....	Cave from roof of stope.
Timothy Lynch.....	August 3, 1891	Sunlight.....	Jefferson.....	Blast in mine
John Donovan.....	August 11, 1891	Hope.....	Jefferson	Blast in mine.

NON-FATAL ACCIDENTS.

NAME.	DATE.	MINE.	COUNTY.	CAUSE.
Pascoe Mitchell.....	January 29, 1894	Anaconda.....	Silver Bow.....	Fell down ore chute.
William Ellis.....	March 11, 1894	Silver Bow No 1.....	Silver Bow.....	Caved on by loose ground.
Dan O'Neil.....	April 3, 1894	High Ore	Silver Bow.....	Injured by a blast.
William Nolan.....	April 4, 1894	Gagnon	Silver Bow.....	Leg broken by falling machinery.
Hugh Sweeney.....	April 11, 1894	Mountain Con	Silver Bow.....	Fell down ore chute.
P. J. Monahan.....	April 12, 1894	High Ore	Silver Bow.....	Fell into an ore chute.
William Miller.....	May 14, 1894	High Ore	Silver Bow.....	Leg caught between cage floor and wall plate.
R. Lamerton.....	June 9, 1894	Mountain View	Silver Bow.....	Stepped into ore chute.
A. Casagranda.....	June 16, 1894	Anaconda.....	Silver Bow.....	Stepped into ore chute.
John Duffy.....	June 27, 1894	High Ore	Silver Bow.....	Rock fell off cage and hit Duffy on head. He was 500 feet below.
M. Simon	August 3, 1894	Belle Mine	Silver Bow.....	Leg broken by fall of rock.
M. Harrington.....	October 4, 1894	Anaconda.....	Silver Bow.....	Blast in mine.
Paddy Morgan.....	October 9, 1894	Anaconda.....	Silver Bow.....	Fall of rock.
Enoch Williams.....	October 17, 1894	Anaconda.....	Silver Bow.....	Stepped into ore chute.

Fatal Accidents.

SILVER BOW COUNTY.

WILLIAM WILLS. January 23rd William Wills and John Renfrey were working together on the eighth floor, between the 200 and 300 foot level of the Pennsylvania mine.

At about 10:15 p. m. Renfrey requested his partner, Wills, to "get the ax." Several yards away was an opening used for dumping in waste, which was received in an old working or abandoned chamber. Over this hole in the floor Wills had secreted a sharp ax to prevent its use by other miners. John Bell heard the request of Renfrey and saw Wills go towards the opening, carrying a lighted candle.

Wills not returning, enquiry was made and search instituted, when it was discovered Wills had secured the ax but in so doing must have miscalculated a step or lost his foot hold and fallen through the aperture to the rocks below, a distance of twenty-one or twenty-two feet. When assistance reached him he was speechless but groaning heavily. His body had struck a crosspole in the descent which created a severe rupture. Three ribs were fractured and the left lung punctured, the skull was broken, a deep cut showed on the right temple and several bruises were noticeable on the scalp. Wills and all the men working on the different floors of the stope were aware of the opening in the floor, which was always left uncovered while the men were at work.

He lived but a short time, never having regained consciousness after receiving the injuries mentioned, and death was undoubtedly the result of accident.

JAMES PROCTOR. At 11:30 on the night of February 3d, James Proctor met with a severe accident on the eighth floor of the stope in the 700 foot level of the St. Lawrence mine, which resulted in death several hours later. He left his work in the breast and started back

towards the ladderway without telling his partner his reason for leaving. Peter McGeegan soon after started for the ladderway and heard some one say a man was in the chute. In order to reach the chute from the direct route from place of work to ladder, Proctor had to make a right angle. He had no candle with him but the shift boss, Tom O'Neil, says there was plenty of light at the chute. Proctor must have walked into the opening in a careless manner, it being evident he was acquainted with the ground, having used the chute for dumping a load of dirt only half an hour previous. McGeegan says Proctor had no occasion to go to the chute and he very naturally supposed Proctor had gone after a drink of water.

L. E. Smith, carman, first heard a noise as of some one in distress in the bottom of the chute, and notified some of the men. Frank Duffy secured a rope, proceeded to the eighth floor and was let down sixty feet, where he found Proctor in a dazed and bleeding condition. He was irrational and continually calling for his wife and for a light. Smith took out the ore and then Proctor and Duffy were let down and taken out. From the statements of those who knew best Proctor must have walked into the opening, and as he did so the body turned, head downward. He passed three bulkheads in the passage to the bottom of the chute, where there was a mass of ore. The head was badly cut and bruised but no bones were broken in the body or limbs. He walked with assistance to the shaft, was assisted on top and taken to the hospital, where he died twelve hours subsequent, not having regained his senses. A rigid investigation at the coroner's inquest failed to show faulty management of the mine and a verdict of "carelessness or negligence on the part of deceased" was rendered by the jury.

SAMUEL COUCH. At 2:30 p. m. April 13th, an accident which resulted in death occurred on the third floor of a stope worked from the 800 level, 600 feet from the main shaft of the Mountain Con. mine.

Samuel Couch and John F. Leary had finished timbering and cleaning up preparatory to shifting to the floor above. Work in the breast had been stopped and the men were ready to leave when Couch thought to secure the timbers a little more by putting a brace between the post and edge of upper face. The brace 10x10 by 3½ feet long was prepared and set ready for tightening. Couch held the brace himself—standing between it and the breast, while Leary set the wedges and drove them in. In his last effort to drive a wedge still farther, the ground above was loosened and nearly three tons of ore

fell, carrying both Couch and Leary to the floor. Leary was stunned to unconsciousness and thinks he must have remained where he fell ten or fifteen minutes. Upon recovering his senses he crawled a few feet and began shouting for help. Couch was found lying partially on his back and side, the brace across his body, several bruises on his head and a deep cut on the right temple as if in the fall the head had struck some sharp instrument or piece of finely pointed quartz. He was, without doubt, instantly killed. I had been sent for immediately the accident was known, and examined the ground and timbering thoroughly as soon as possible after I had seen the body carefully conveyed to the surface and placed in the hands of the coroner. Every thing in the neighborhood of the accident I found had been prepared in a safe and workmanlike manner. The cave was caused by a large soapy seam which ran through the body of ore and thus broke its solid contact. The setting of the brace so tightly had broken loose the edge of the ore body next the seam and from lack of support it necessarily fell. I consider the accident as unavoidable because unforeseen.

RICHARD PROUT. At midnight April 17-18, Richard Prout met with a most horrible death in the main shaft of the Mountain View mine at Butte. He had gotten on to the upper deck of the cage with a number of other miners at the 1,100 station and was apparently in the best of health and spirits. When the cage reached a point 110 feet from the surface, Prout's body was felt by two of his fellow-workmen to jar against them as if he had let go the safety bar and slipped down. There were nine men on the upper deck and a like number on the lower deck.

Thomas Wilcocks says he was standing by Prout's side and felt something rubbing his (Wilcocks) leg. He put one hand down, then felt about him and missed Prout from his place on the cage. He heard no noise, no groan or cry, and felt no jar of the cage. It was perfectly dark in the shaft. In a minute's time the cage was at the surface, when the men discovered Prout was absent or rather missing from their number. It was evident Prout had fallen from the cage. I was immediately notified and reached the mine half an hour later. Search had been commenced for the body but it was not found. Upon my arrival, in company with three other men, I made a very rigid examination of the shaft and discovered evidences of Prout's body having struck the plates or timbers at different points from where the accident occurred to the 400. There were pieces of skull, brains

and flesh on some of the plates. The body had presumably gone to the sump, which contained about twenty feet of water. The pumps were at once put to work, the water exhausted in less than an hour's time and the body and limbs recovered. There was no evidence of any portion of the head only what we had seen upon the plates when descending shaft the second time.

After the remains of Prout had been taken to the surface and turned over to Coroner T. C. Porter, I again descended the shaft to the 1,100 level. In the crosscut where Prout and others had been working I found everything in excellent working order and the air good. Hence I infer that the deceased could not have been made suddenly sick from the inhalation of foul air. In the shaft, which was examined minutely, I found the timbering as perfect as possible; in fact, the cage, guides and everything pertaining to the shaft and conducive to the safety of employes, was in good condition. The only theory advanced as to the accident was that Prout must have fainted from some unknown cause and fell from the cage between two plates. His body fell a distance of 1,020 feet.

THOMAS WILLS. At the Pacific mine, in Butte, on the night of April 19th, Thomas Wills lost his life. He was ascending the shaft with R. M. Rodda at 11 o'clock. Both men were riding on the bucket, standing on opposite sides of the bucket's edge, one knee pressed against the bale and one hand of each man grasping the rope. The shaft is vertical for a distance of 130 feet, then takes an incline of about seventy degrees.

It is customary for the men to lean their heads close against the rope while ascending the shaft and is in fact necessary that they should in order to avoid striking the roof or "hanging" where the incline connects with the vertical. Wills must have neglected to take this precaution and notwithstanding the bucket was going up very slowly his head or shoulder probably touched the ceiling and he was jarred off the bucket. He fell to the bottom, a distance of seventy feet, and struck a piece of timber with sufficient force to break some of his ribs. His head was also bruised and the scalp cut in one or two places. He lived less than half an hour but did not recover consciousness sufficient to tell how the accident occurred. I was at the mine a short time after the occurrence and made a thorough examination of the shaft, which I found closely planked on the inside of the timbers, thus forming a smooth surface on all sides from surface to bottom. No blame could be attached to faulty timbering, machinery or care-

lessness on the part of anyone aside from that of the deceased, who should have clutched the rope tighter and leaned toward the center when coming up the incline.

JAMES O'BRIEN. On the 9th of May James O'Brien met with an accident in the main shaft of the Anaconda mine. His injuries were of so serious a nature that he died the day following. It appears he was at work with a fellow miner named Murphy near the 1,100 foot station, preparatory to the taking out of a pipe. A hammer and tongs were required when O'Brien volunteered to get them. In descending the ladder his foot slipped from one of the rungs. The unfortunate man's body passed through the manway in the platform above the station and descended to the 1,200 level where it was recovered in a terribly bruised condition.

I visited the mine and found the timbering, and in fact everything connected with the shaft, in perfect order. Thorough investigation convinces me the accident was purely accidental.

RICHARD HOCKING. During the afternoon of June 7th Richard Hocking was instantly killed in the old tunnel of the Magna Charta mine. Hocking and John Martin had a lease from the Alice Company and were at work about 1,300 feet from the mouth of the tunnel, just north of the Magna Charta shaft. Hocking was only four feet from Martin when suddenly a rock, weighing about 3,000 pounds, fell from the hanging wall over the drift and struck Hoeking between the shoulders. He was crushed to the floor without uttering a sound and probably instantly killed.

I examined the tunnel and spot where the cave took place about two hours after the accident and found it unsafe in every respect. The men had been grossly negligent in not timbering up the ground. The management of the Alice properties informed me that he had not only furnished plenty of timber free of all cost to the leasers but had insisted upon their using it as fast as required not only for the safety of the men but to protect the mine itself, hence the accident is attributable to carelessness or negligence of the leasers themselves.

SAMUEL RUNDLE. On June 11th, while at work on the fourth floor of the 1,200 foot level of the Grey Rock mine, Sam Rundle had occasion to go to the surface. In his hurry he fell into a hole in the floor, used for dumping waste, and struck upon a girth four feet below the opening. Rundle was seriously injured about the chest,

the lungs and heart affected, and lived only thirty-six hours after his removal from the mine.

I made a thorough examination of the place where the accident occurred and found everything in workmanlike shape, hence can attach no blame to the company or management.

MICHAEL BRADY, JAMES MORGAN, JOSEPH CURRIE. These men met death by drowning on August 21st at the Glengarry mine, owned and operated by Heinze. A force of men had been at work in the west end of the 100 foot west level where, according to the survey, Mr. Heinze supposed he had forty feet more to run before reaching the boundary line of the Glengarry. At about the noon hour the last blast fired in the face of the west level broke the ground into old workings of the adjoining claim, which had been lying idle and allowed to fill with water. Michael Brady and Gus Anderson were working on a raise from the 200 at the time the last shot was fired in the west end of the 100 foot level. This shot having broke through into the old workings permitted a flow of water through an aperture six feet high and two feet wide which soon flooded the mine. Very many of the miners became alarmed either by the noise caused by the rush of water or by seeing the water approaching and made their escape.

Gus Anderson, the working partner of Brady, says they were two floors above the 200 level and 150 feet back from where the water broke through and nine floors below the 100. When the water came tumbling down the raise where they were timbering Anderson was caught and carried down with it. He caught himself before he struck the level and called to Brady to stay where he was (a little back from the raise) and he would be safe. An instant later the force of water broke his hold and carried him fifty feet farther and into the level when he caught and climbed up the lagging on the side of the level and managed to get his arm over the air pipe running back into the level. The water was nearly to the top of the level but Anderson held on until it subsided, when he groped his way in the dark to the station and was taken to the surface.

Brady must have attempted to go up the raise, as his body was found at the ore chute, between the 100 and 200, forty-five feet from where he had been at work. A wound was on the head, probably caused by a falling rock. The head was lying down the raise and the body was covered with fine dirt.

The Currie and Morgan bodies were found in a stope between the 200 and 300 foot levels, their right hands clasped and left arms around each other.

These two men had been companions from childhood, had traveled the world over together, always worked together, died together and were subsequently buried side by side in a single grave.

I examined the Glengarry mine closely after the water had been pumped out as well as from day to day so far as I could possibly do so from the time of the accident, giving it the closest inspection, and have found everything about the timbering and general workings in good order, and find every precaution for the safety of men has been taken by the management. I tried to have a survey made of the grounds belonging to Mr. Heinze and that of the company adjoining and from which the water broke into the Glengarry but find no provision in the mining laws under which I could legally act in the matter, hence I am unable to determine where to locate the blame or carelessness, or neglect, whichever it may be, and to which this sad loss of life is attributable.

JONN H. MURRAY. On the morning of August 25th John Murray met with a most horrible death at the Belle of Butte mine, Walkerville. The property, which belongs to the Butte and Boston Company, has not been worked for over a year. Murray and Charles Kilday, had taken a lease of the mine and on the morning of the 25th they, together with Frank Doyle started to work, intending to repair the shaft near the surface. Murray had just finished passing a lot of lumber from the surface down to Doyle and Kilday, who were ten or twelve feet below. Murray then started down the ladder, but when only eight feet from the top a section of the ladder gave way and with Murray fell down the shaft a distance of 150 feet, where his body struck a plank flooring. Murray was a man who weighed at least 150 pounds and his great weight falling from so great a distance broke the plank in two, allowing the body to continue to the bottom of the shaft, 500 feet from the surface, where it was subsequently found in a badly bruised and mutilated condition with life extinct.

Upon examination of the ladder I discovered that this particular section which broke away was affected with dry rot and not having been tested for several months by any great weight or strain the defect was not apparent through casual observation. The timbering in the shaft and the balance of the ladder were in good condition.

WILLIAM LAUGHLIN. A very serious accident occurred at the High Ore mine, Centerville, on the 15th of September which resulted in the death of William Laughlin on the 26th inst. Laughlin, with four others, got onto the lower deck of the cage at the surface and was lowered to the 1,200 foot level. One man got off and while Laughlin and Charles Actis were in the act of stepping from the cage to the station the cage was suddenly lowered about eight feet. Both men were thrown back onto the cage and both had their right foot caught between the wall plate and upper floor of the cage.

Actis was caught by a fellow workman in time to save his head being chopped off but the foot was badly crushed.

Laughlin was more unfortunate, having been caught above the knee. At the time of the accident he had hold of the safety bar and did not release his grasp even after becoming unconscious.

When the cage was hoisted Laughlin was taken to the St. James hospital, but only lived till the morning of the 26th.

Upon inspection of the engine I found it to be a new one and the brake not in perfect working order.

PATRICK LYONS. On the 20th of October, just after the cage had been cleared of some timber at the 1,000 foot level in the Anaconda mine and the signal had been given to hoist, Patrick Lyons, who had been assisting in some special work below, started to get on to cage. Having no occasion to go to the upper levels or surface, it is not known why he should have wanted to get aboard. He had not said he was going up nor had the station tender or any one else asked him to leave the station. The cage having started before Lyons got fairly onto the floor, he was caught between the upper floor of cage and wallplate, and so seriously injured that he died the following Sunday. The coroner's jury find the accident and death were attributable to the carelessness of deceased.

JOHN G. NICHOLSON. October 23d witnessed as complete a case of criminal negligence, resulting in death, as was ever recorded. About 3:30 p. m., just after the men had gone on shift at the Mountain Con. mine at Centerville, John G. Nicholson and Paddy Mannix were on the west cage at the 700 foot level and desired to go below. The east cage was at the 800 level. When the signal was given to hoist the east cage, William Koontz, the brakeman, adjusted the clutch so that the west cage would descend as the east cage came up.

It appears from the evidence given at the coroner's inquest that Kooutz had lowered the men to the 700 level, using only the brake. This was in direct violation of the rules, which call for the use of the engine when men are on board. When the engineer, Charles Longmuir, received the signal to hoist the east cage he knew there were no men aboard and therefore started the engine with that rapidity used in hoisting ore or lowering empty cars. Had either the engineer or brakeman looked at the indicator for the west shaft they would have seen that the cage in this compartment was at the 700. Neither of them did look at the indicator but the brakeman says he thought the west cage was at the forty foot level and so put on the clutch. By his own testimony he acknowledges that he had lowered the cage from the 40 to the 700 only two or three minutes before, and had entirely forgotten it. When the engineer started the east cage upward the west cage went downward at fearful rate of speed, considering two men were on the first floor, and struck the bulkhead over the sump just below the 900 station.

Paddy Mannix had his right thigh broken and his right heel smashed. Nicholson was thrown off his balance and probably stunned by the crash. This would in probability have ended the accident had not the engineer discovered the situation and again acted contrary to orders. Very much slack rope had come down on the bonnet of the west cage after it struck the bulkhead and the engine was stopped. The engineer, without having received a signal to hoist, immediately reversed the machinery and took up the slack rope. When the slack was entirely taken up the taught rope raised the cage a few feet.

Nicholson was lying on the floor of the cage presumably unconscious. When found a portion of his head and shoulder were between the floor of the cage and wall plate, the back part of the skull badly crushed and the right upper side smashed in. He was evidently killed outright by the raising of the cage at the time the slack rope was reeled up. Both Longmuir and Kooutz swore before the coroner's jury that the accident was attributable to their own carelessness and neglect. The entire workings of machinery, cages and shaft were in perfect working order when the accident occurred.

JOSEPH SAUVE. Friday morning, Nov. 16th, while picking a place to fit in a butt-cap on the second floor of the south ledge of the 300 foot level in the Virginian mine, Butte, Joseph Sauve was caved on by a mass of vein matter which fell from the roof and so seriously injured that he died a few minutes later. He had been at work with

C. P. Dandaneau in the breast of the stope and the ground was considered perfectly safe. Dandaneau had been to the surface after the butt-cap and was returning to put it in place. When but three or four feet away a chunk of hard ground weighing 1,500 pounds fell suddenly and nearly buried Sauve. His right leg was broken above the ankle, the back of his skull smashed in, the face and head badly bruised. No possible blame is attached to the management.

BEAVERHEAD COUNTY.

BERNARD PFISTER. February 18th this young miner was instantly killed at the Atlantis mine, one of the Hecla properties. Pfister had just gone to work with Dan McGillvray in the old Harrison level, where the night shift had recently fired a couple of shots which left the ground in the back of the level in a very loose and dangerous condition. Pfister followed McGillvray into the workings but was told to go back and he would be called when wanted; that there was a lot of bad ground to be taken down. Pfister approached the secend time, was warned again, turned to go back, then stopped to take another look when about 1,500 pounds of rock fell from the roof and crushed his life out instantly. I inspected the mine very carefully and found it well timbered and ventilated.

JEFFERSON COUNTY.

TIMOTHY LYNCH. On August 3d, Timothy Lynch, who resides in Walkerville, Silver Bow county, met with a horrible death in the Sunlight mine at Whitehall.

Lynch and a miner named Burns had drilled ten holes in the bottom of a 180 foot winze in No. 2 tunnel. While Burns was putting the tools away Lynch went to the level, procured fuse and powder, returned to the bottom and prepared ten holes for blasting. The orders given by the management of the mine require seven feet of

fuse to be put in each hole that the workmen may have ample time to get away from the blast in perfect safety. In his hurry Lynch had only secured forty feet instead of seventy feet of fuse, and thinking he had not time to go after more, he loaded each hole and attached to the caps but four feet each.

Burns and Lynch "spit" five holes each and mounted the bucket to go to the level. Henry Ellis, the engineer, hoisted fourteen feet when the bucket caught and stopped the engine on the center. Lynch got off the bucket, after which Ellis got the engine off the center and began hoisting. He soon got a stop bell, then bell to lower, then stop bell, then bell to hoist. When the bucket was forty-five feet from the bottom the first blast went off and immediately a second one, which threw Lynch off the bucket. Lynch fell down the winze and was in the midst of all the flying rock and dirt thrown up by the remaining eight shots which occurred almost simultaneously. He was instantly killed and the body terribly mangled.

I am satisfied that if Lynch had not rushed his work but had obeyed orders and cut the fuse seven feet instead of four, the accident would not have occurred.

JOHN DONOVAN. At 11:45 a. m. August 10th, John Donovan was literally blown to pieces in No. 2 crosscut of the 250 foot level of the Hope mine at Basin.

Donovan and his partner, John Davey, had loaded seven holes and were ready to fire them. They had spitted three holes each and Donovan went to the seventh. He discovered the fuse was wet and would not ignite. He informed Davey of this fact and appeared anxious to fire the hole before leaving. Davey urged him to "come away" and left the place himself, going about ten feet into the level and then six or eight feet east, when the blasts went off suddenly. Donovan was nearly torn to pieces and thrown ten feet into the level by the first shot. The body was covered by rock and debris thrown out by the other shots which followed instantaneously.

Non-Fatal.

PASCOE MITCHELL. On January 29th, at the Anaconda mine, after Mitchell had fired four holes and retired to a safe distance he met Superintendent Kane and Foreman O'Neil, with whom he conversed for a short time, and then said he would go and see the effect of his shots. He was advised to remain away until the smoke cleared. He went back part way, however, to look for his blouse and secure some matches. While groping about in the dark he tumbled into an ore chute and fell seven floors. He was badly but not seriously injured.

WILLIAM ELLIS. March 17th, while William Ellis was working on the eleventh floor, between the 400 and 500 levels of the Silver Bow No. 1, he was caught by a fall of ground which had been loosened by a recent blast. He knew the ground was loose and went to the place for the purpose of taking it down. When it struck him he was knocked off the eleventh and fell to the ninth floor, sustaining severe injuries. No blame is attached to the company.

DAN O'NEIL had his head and face severely injured on April 3d while at work on the fifth floor of the 500 level of the High Ore mine. O'Neil had been warned that a blast was to be set off on the floor below, where a couple of men had been at work, and was told to go away out of danger. He remained at his place of work and received a portion of the rock and dirt thrown up by the shot directly in the head and face.

WILLIAM NOLAN and his working partner had been engaged in drilling a set of holes in the 1,100 west drift of the Gagnon mine, on the 4th of April, and were using a heavy drilling machine. The

blocking came out from under the machine, when it fell and struck Nolan on the left leg, breaking that member below the knee.

HUGH SWEENEY, a miner, was seriously injured on the 11th of April in the Mountain Con. mine, Butte. He and his partner had blasted a round of holes over the ore chute on the eighth floor of the 600 level and returned to take down the loose dirt. Sweeney put a 2x10 plank over the chute and began taking down the ground when a large rock fell upon the plank, broke it in two and precipitated Sweeney into the chute. He fell a distance of three floors and landed on the body of ore. He was injured about the back and head, also received many contusions and abrasions of the skin.

P. J. MONAHAN, a miner at the High Ore mine, met with an accident on the 12th of April which very nearly resulted in death. He was at work on the eighth floor of the eighth level and had put in and prepared a round of shots for spitting. Monahan went back to the manway, got under the floor and blocked it up. On his way back to the stope he fell into the ore chute and fell a distance of five floors. He was so badly bruised his life was endangered for several weeks. Having worked there for several months he was familiar with the place and attributes the accident to his own carelessness.

WILLIAM MILLER, a miner at the High Ore, had his leg broken on the 14th of May. He was loading iron rail onto the cage at the 500 station when the engineer, in some mysterious manner, got a bell to hoist. The cage started upward and Miller's leg was caught between the floor and wall plate.

RICHARD LAMERTON, on June 9th, accidentally stepped into an ore chute on the seventh floor of the 800 level in the Mountain View mine and falling several floors broke his left leg. He had been getting ready to put in a set of timbers at the chute, which was half covered with plank, and only an opening large enough to receive ore was left exposed. Lamerton missed his footing, which resulted as above mentioned.

ANTONE CASAGRANDA, a miner at the Anaconda, was badly injured on the 16th of June by falling down the ore chute on the seventh floor of the 800 level. He had been after a bucket of water and when returning to his stope stepped into the chute and fell a

distance of thirty-five feet. The man was so seriously hurt his friends had doubts of his recovery. The chute had been left open in a very careless manner. I must say that these chutes are on the order of "traps" which often catch the unwary miner, and I have notified many of the superintendents to have all the chutes in their mines better protected.

JOHN DUFFY very nearly lost his life on June 27th while working at the bottom of shaft No. 2 of the High Ore mine. A load of rock had been sent to the surface when a piece fell off the cage and struck Duffy on the head, 500 feet below. The men working in the shaft had been told repeatedly not to load the cars too full and to always see that the floors were clear before giving the signal to hoist.

M. SIMON had a leg broken by a hundred-pound rock falling from the breast of the west drift on the 1,000 foot level of the Belle mine on the 3d of August. Simon and his partner were taking down loose dirt after a blast. I found the drift well timbered and the ground safe.

MARK HARRINGTON had a narrow escape from a horrible death in the Anaconda mine on the 4th of October. He and J. P. Hickey had put in a round of holes in a stope on the fourth floor of the 600 level. When ready to blast Harrington fired the fuse and went up to the third floor while Hickey went down to the level below. This was done to prevent anyone going up or down at the time of blasting. Harrington heard three shots and waited for some time before going below. Concluding the fourth shot had missed, he descended the manway and entered the stope. As he came near the place the blast went off and caught the unfortunate man with its full force. His legs, body and face were horribly lacerated by the flying rock and the bones of one knee were broken.

PADDY MORGAN was rather badly injured while drilling a hole for a sill on the 1,000 level of the St. Lawrence mine October 9th. A slab of dirt fell from the hanging wall and caught him in the back. The ground was well timbered up to the face.

ENOCH WILLIAMS had a close call for his life October 17th on the eighth floor of the 1,000 foot level (east) of the Anaconda mine. It was Williams' first shift and the tool boy came around to tell him

where the tools could be found. Williams went after them and when returning stepped into the ore chute and fell eight floors, or sixty-five feet. He received but one little mark on his forehead, but was so severely shaken up he could not work for three or four days.

Mines.

SILVER BOW COUNTY.

THE SUNNY SIDE, owned by the Anaconda Company, is operated and managed by Peter Breen and John Fogarty. John Fogarty, superintendent; William McClare, foreman. Eighteen miners and three topmen are employed. The shaft is two-compartment, 500 feet deep. Timbering is done with square sets. Character of ore copper and silver. Single deck cages are used in hoisting, with 1 inch steel rope, handled by a 10x12 double cylinder engine. Safety appliances are in place and tested once each week. Ventilation is good, and there are two places of exit.

THE RARUS, located at Butte, is owned and operated by P. Tetreault, Joe Sortie and Emanuel Hirbour. Peter Tetreault is superintendent and manager; Samuel Doust, foreman. Thirty-four miners and eleven topmen are steadily at work. The shaft is two-compartment, 600 feet deep. Timbering is done with half sets and square sets. Single decked cages, $\frac{3}{4}$ inch steel rope and 10x12 double cylinder engine are used in hoisting. The safety appliances are good and are tested twice each week. Ventilation is fair. There is but one exit.

THE GOLD HILL and WASHOE are new properties, owned and operated by the Gold Hill Mining Company. C. F. Booth, superintendent; Edwin Edwards, foreman. Eight miners and ten topmen are employed in the Gold Hill. The three-compartment shaft is at present but sixty feet deep but sinking is still in progress. Square sets are used in timbering. Buckets and crosshead are used for hoisting with $\frac{7}{8}$ inch steel rope, handled by a $6\frac{1}{2} \times 8$ inch double cylinder engine.

The Washoe employs eight miners and six topmen. The shaft

is two-compartment, 165 feet deep, timbered with square sets. Bucket, crosshead, 1 inch steel rope and 9x11 double cylinder engine are used in hoisting. Sinking is going on steadily.

THE MODOC, owned and operated by the Anaconda Company, M. J. O'Farrell, superintendent and manager; John Carey, foreman; employs twenty-four miners and ten topmen. The shaft is three-compartment, 950 feet deep, timbered with square sets. Character of ore, copper and silver. Single-deck cages, 1 $\frac{1}{4}$ inch steel rope and 14x18 double cylinder, slide valve, Park & Loosey engine are used for hoisting. Safety appliances are in place and tested once each week. There are three places of exit, and ventilation is good.

The company is sinking to the 1,000 foot level.

THE YELLOW JACKET, owned and operated by the Anaconda Company, M. J. O'Farrell, manager; William Shovell, superintendent and foreman; employs twelve miners and six topmen. The two-compartment shaft is down 170 feet and is timbered with square sets. Single-deck cage, 1 $\frac{1}{8}$ inch steel rope and 10x12 double cylinder engine are used in hoisting. Sinking is steadily progressing.

NETTIE SHAFT No. 3, owned and operated by the Colorado S. M. Co., C. W. Goodale, manager; John Hewitt, superintendent and foreman; employs fourteen miners and five topmen. The two-compartment shaft is down 500 feet. Timbering is done with half sets. Single deck cages, 1 inch steel rope and 8x12 double cylinder engine are used in hoisting. Safety appliances are in place and tested every two weeks. Ventilation is good, and there are four places of exit.

THE GREY ROCK, owned and operated by the Butte and Boston Mining Company, C. H. Palmer, manager; James Hoatson, superintendent; Dave Polkinhorn, foreman; employs 150 miners and twenty topmen. The three-compartment shaft is down 1,300 feet. Timbering is done with square sets. Character of ore, copper and silver. Double-decked cages, 5/8x5 inch steel flat rope, handled by a 20x48 double cylinder engine, are used in hoisting. Safety appliances are tested twice each week. Ventilation is good, and there are three places of exit.

THE MOOSE, owned by the Boston and Montana Mining Company, is operated and managed by Joseph Annear, who has the prop-

erty under lease. Eight miners and two topmen are employed. Hoisting is done with single-deck cages, $\frac{3}{4}$ inch steel rope and 8x10 double cylinder engine. The shaft is three-compartment, 300 feet deep and timbering is done with stulls. Safety appliances are tested every week. Ventilation is good and there are three places of exit.

THE MOUNTAIN VIEW and PENNSYLVANIA are owned and operated by the Boston and Montana Mining Company. Thomas Couch, manager; Richard Dawe, superintendent and foreman. The Mountain View employs steadily 136 miners and thirty-one topmen. The mine is worked through a three-compartment shaft, 1,100 feet deep, and timbering is done with square sets. Character of ore, copper and silver. Hoisting is done with double-decked cage, $\frac{3}{8} \times 5$ inch steel flat rope, handled by a 15x48 cylinder engine. The safety appliances are good and are tested twice every week. Ventilation is excellent, and there are three places of exit.

The Pennsylvania employs seventy-one miners and thirty-five topmen. The shaft is three-compartment and 600 feet deep, timbered with square sets. The character of ore is copper and silver. Mode of hoist is with double-decked cages, $\frac{3}{8} \times 5$ inch flat rope, handled by a 19x48 cylinder engine. The safety appliances are tested twice each week. Ventilation is good and there are three places of exit.

NOTE—Both the Mountain View and Pennsylvania mines have an air course over the timbering in each level for ventilation purposes.

THE ISLE is owned by M. Shaughnessy and operated by L. M. Holland & Co. L. M. Holland, superintendent and manager; John Odgens, foreman. Ten miners and four topmen are employed. The shaft is two-compartment, 300 feet deep, and timbering is done with half sets and stulls. The character of ore is silver and gold. Hoisting is done with bucket, 1 inch steel rope and 8x12 double cylinder engine. There are two exits and ventilation is good.

THE HIBERNIA, owned by the Davis estate, operated and managed by Sullivan & Co., Morris Roach, foreman; employs twenty miners and four topmen. The shaft is double-compartment, 250 feet deep, and timbering is done with half sets and square sets. The character of ore is silver. Bucket and crosshead with $\frac{3}{4}$ inch steel rope, handled by an 8x10 double cylinder engine are used in hoisting. There is but one exit, and ventilation is good.

THE LIZZIE MINE, owned by Hickey Brothers, operated and

managed by Terry Lennon, employs eight miners and four topmen. The shaft is double-compartment, 295 feet deep, and timbering is done with square sets. Character of ore, copper and silver. Hoisting is done with bucket and crosshead, $\frac{3}{4}$ inch steel rope and 8x10 cylinder engine. There is but one exit, and ventilation is fair.

THE NORA MINE, owned by Dolman and McBride, is operated and managed by Pat Mullins. Seventeen miners and three topmen are employed. The shaft is double-compartment and 320 feet deep. Square sets and stulls are used in timbering. The character of ore is copper and silver. Single-deck cage and $\frac{7}{8}$ inch steel rope, handled by a 7x10 double cylinder engine are used in hoisting. Safety appliances are in place and tested once each week. There are two exits, and ventilation is good.

BEAVERHEAD COUNTY.

THE LONE PINE, situated at Ponsonby, is owned and operated by the Jay Hawk and Lone Pine Consolidated Mining Company. James Prideaux is foreman, superintendent and manager. Sixty-two miners and twenty-three topmen are steadily employed. The main shaft is double compartment, 1,600 feet deep, on an incline, and the second shaft 130 feet, vertical.

A tunnel has also been run in 300 feet. Timbering is done with stulls, and the character of ore is silver. A single-deck cage is used in hoisting, with $\frac{7}{8}$ inch steel rope, handled by 7x12 and 8x12 cylinder Fraser & Chalmers engines. Safety appliances are in place and tested twice every week. There are two exits, by shaft and tunnel, and ventilation is fair.

